

CHOICE

www.choice.com.au

Seeing in the New Year?

Over 60 bubbly
to choose from ...
... and find the best
crackers for
Christmas

Solar water
heaters on test:
worth buying where
you live?

MORE TESTS:

- Beach sun shelters
- Cockroach killers

Bright stars in a dark sky



Jane Mackenzie

You'd expect Australia to be the perfect place for a solar water heater. Certainly plenty of you think it would be — our Consumer Services department gets a lot of enquiries about them. Part of the attraction for many people is their environmental friendliness compared to other systems, though saving money on power bills is a motivation too.

Do they live up to their reputation? Largely, yes. An overwhelming majority of subscribers who wrote to us about their experiences with a solar water heater are very happy with their investment, reporting

trouble-free operation for 15 years or more. And our test report (starting on page 29) shows there are clear reductions in the amount of carbon dioxide produced by them compared with electric water-heating systems — except perhaps in Tasmania, with its hydroelectric scheme.

Unfortunately, beyond that the picture is less clear. Compared with gas systems, some of the poorer solar performers don't produce less CO₂. And as for saving money, that really depends on where you live and which system you'd be replacing.

Some areas, though — Queensland, parts of NSW, and Whyalla, SA — have taken the initiative in giving you a hand to save money when you buy a solar water system by offering various rebates. If schemes like these were widespread, they might convince more people to choose these environmentally friendlier systems — and higher sales figures should eventually lead to economies of scale, reduced prices and a winning situation all round. CHOICE wants to see more of these bright rebate stars in an otherwise dark sky.

On a simpler note, this issue would also like to help you celebrate Christmas and the New Year. There's a great selection of festive fizz (page 7) plus a choice of Christmas crackers to suit every kind of get-together (page 12).

On behalf of all the staff here at CHOICE, I'd like to wish you all a very happy Christmas and a healthy and Y2K bug-free New Year.

Jane Mackenzie, Editor

Your letters

We welcome the letters you send us — please always include a daytime telephone number so we can contact you quickly if we want to follow up your letter. We're sorry we can't personally answer every letter we receive, but we do use them in our research. Thanks for taking the time to keep in touch.

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Cover photo: Kent Mears



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Your subscription and the GST

The GST comes into effect on July 1, 2000, and will apply to any issues of CHOICE in your subscription period that go past this date. As a non-profit organisation we can't afford to absorb this cost and will be including it in the subscription price. So if you subscribe or renew your subscription any time between August 1999 and the end of June next year, some of the issues will attract the tax. After July 1, GST will apply to the whole subscription.

The order form on page 49 shows the subscription prices for periods starting from the next issue, and they'll be updated every month up to July 2000. If you have any queries about this, please call CHOICE Consumer Services on (02) 9577 3399 (or see the bottom of page 2 — far left — for further contact details).

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In some places the systems that performed well in this test can pay for themselves in a few years — find out where in this test report.

43 Murder, mayhem and massacre: cockroach killers

Summer's here, bringing lazy afternoons in the sun, weekends at the beach and ... cockroaches. How can you keep your home roach-free this year?



CHOICEcuts

Breadmaker blades can't handle roughage

CAROLYN LEYS OF GUNNDAH, NSW, loved her new Breville breadmaker and baked bread with grains in it every day. But within six months her delight turned to disappointment: the non-stick coating on the kneading blade was wearing off.

Breville told her the coating was new Teflon, which was inert and non-toxic, and that the kneading blade was replaceable (for around \$10 plus postage and handling). "It may seem a minor problem, but I object to having pieces of Teflon in my lovely fresh loaf, even if it is non-toxic. I also

object to having to buy a new kneading blade every few months," said Carolyn.

Breville told us the kneading blade in breadmakers is often Teflon-coated so the dough slides off more easily and you don't waste dough that sticks to the blade. But neither Breville nor other manufacturers could give us a clear indication of how long you can expect a blade to last: it's regarded as a 'consumable' item and it depends on how you use it. Two factors seem to influence its lifespan most:

■ The type of bread you bake. The coating will wear off sooner if you bake a lot of bread containing wholemeal, wholegrain, linseed or other grains or seeds.

■ How often you use it. One manufacturer said the blade should last for about 12-18 months if you bake one loaf a day; another that it should last about three years if you use it three times a week to bake a normal (white) loaf.

Obviously, rough cleaning materials and scratches from a fork or knife will also affect it.

Most manufacturers said they'd consider replacing the kneading blade under warranty, depending on the way it had been used.

The replacement blade Carolyn received for her breadmaker was still in good condition after four months. "But I haven't made wholegrain bread, and I don't use it as much now, perhaps only three times a week," she said.

Update

Buying a used car CHOICE, September 1999

The phone number for the Victorian title register, VSR, has changed: it's now 13 11 71. You can't call this number from outside Victoria or on a mobile phone. The interstate phone number is 1800 814 762



REBECCA RYAN

Winners!

The five winners of the Consumer Bookshelf Spring/Summer Catalogue draw are:

- Ms A Harvey, Wanniasa, ACT.
- Mr N Bland, Wyndham Port, WA.
- Ms F Campbell, Marrickville, NSW.
- Ms J Huyber, Ayers Rock, NT.
- Mr T Flaherty, Modesty, SA.

They won their book orders free of charge. Congratulations to all.



CHOICE is one of many consumer magazines from organisations worldwide that make up Consumers International. Get the lowdown on what's happening with your fellow consumers around the world in World Consumer Snapshot.

■ Innovations

Sony has released a portable battery-operated DVD (digital versatile disc) player and special multimedia glasses with two LCD monitors that simulate a virtual screen of 1.3 metres. The idea is you can watch movies no matter where you are: on the way to work, camping in the wild ...

Germany's *Test* magazine put the package through its paces, and found that although the portable DVD isn't much different from a regular DVD player for picture quality, it's not quite as good for sound.

The glasses were uncomfortable and tiring, and came with six pages of warnings and health hazards. Overall they were pretty disappointed with the package, especially considering the price: about A\$3000. But perhaps the headline best sums it up: *Virtual banality.*

■ Another reason to stop smoking

Germany's *Test* magazine reports that the British Health Ministry has asked for a new warning on cigarette packets sold in the EU: "Smoking makes you impotent". Researchers have found that men who started smoking in their teens or twenties have a 50% higher risk of becoming impotent in their 30s or 40s than non-smokers.

■ Things that go bump in the night

Some bad news for kids who are afraid of the dark: sleeping with the light on increases your chances of suffering from myopia (short-sightedness) later in life. France's *Que Choisir* reports that 55% of kids who sleep in bright light develop myopia, compared with 34% who sleep with a night light and 10% who sleep in the dark.

Y2K scare scam

AFRAID YOUR BANK might lose your money in a Y2K glitch? If you are, don't fall for a scam targeting your worries.

Overseas, bank customers have received a call from someone claiming to be an officer of their bank. The caller said the bank was having problems getting ready for the Year 2000 and asked the customer to transfer their money to a 'safe' account. They were then asked for their account information and authorisation for the transfer of their funds.

This 'safe' account is of course anything but a safe place for your savings, warns the Australian Securities & Investments Commission (ASIC). The swindle started in the US and then targeted UK bank customers; Australia may be next.

In another version of the same scam, the caller claims to be from your credit card company. He says you need new magnetic strips for your credit card as the old strips won't be Y2K-compliant, and then asks for your credit card number.

The Council of Financial Regulators — a body comprising the Reserve Bank, the Australian Prudential Regulation Authority and ASIC — says the Australian financial system is ready for the Year 2000. For more information see *Y2K and you* (CHOICE, September 1999).



Over 100,000 Australians have lost their money in fraudulent and illegal investments in the last 10 years. Here we review the latest investment news from the Australian Securities and Investments Commission (ASIC) and give you tips on how to avoid investment pitfalls. For further information call the ASIC infoline on 1300 300 630 or check its website on www.asic.gov.au.

\$4.7m lost to junk jewellery promoters

The Jewelway scheme has been placed in liquidation. It operated by recruiting sales agents, who paid for gift certificates that could be resold and redeemed for jewellery. The head company, located in the US, has been declared an illegal pyramid scheme by the US Federal Trade Commission.

NSW Minister for Fair Trading, John Watkins, said in parliament that Jewelway had targeted mainly Asian migrants and that the "junk jewellery" wasn't worth the cost of the gift certificates.

The company said there are still 37,317 unredeemed gift certificates, worth \$4.7m.

More pyramid schemes

An email chain letter, also from the US, promised Australians, "You are about to make at least \$50,000 in less than 90 days." They were told to send \$5 to each of several names on a list, then replace one of the names with their own name and forward the email to thousands of new names using bulk email.

Yet another Internet pyramid scheme was stopped by the

ACCC: an Internet service provider had been promoting an income scheme that gave its members financial rewards for introducing new members.

All participants in the scheme are entitled to refunds if they discontinue their subscription to the Internet service.

What is pyramid selling?

The SA Office of Consumer and Business Affairs recently published a list of more than 50 pyramid schemes operating in South Australia in the last year.

These schemes promise quick and easy money. They typically include chain letters, and:

- You pay money to join.
 - You recruit others who also pay money to join.
 - You're promised a profit once you've recruited a certain number of people.
 - Some pyramid selling schemes operate by selling goods that are overpriced and of poor quality.
- The difference between them and legitimate marketing schemes is that pyramid schemes provide rewards not for genuine product sales but for the introduction of new participants to the scheme.

Because members make money by recruiting others, those who start

the scheme have an advantage over those who join later.

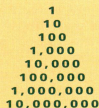
Ultimately a pyramid scheme is doomed to collapse because there's a limited number of people who'll join (see graphic, below).

The Trade Practices Act makes it illegal to participate in or promote pyramid selling schemes.

CHOICE advice

If you're asked to join a scheme that sounds like pyramid selling:

- Don't agree to join during a meeting or a seminar — go away, do your homework and think about it first.
- Never give out your credit card details, other financial or personal information.
- Check with the Department of Fair Trading/Consumer Affairs in your state or territory whether action has been taken against the scheme.
- Contact the ACCC office in your state to ask if they know about the scheme and get advice on whether it's pyramid selling. You could also check www.accc.gov.au for information about the scheme.
- Don't forget: if it sounds too good to be true, it probably is.



A pyramid scheme is doomed to collapse because each level of the scheme needs more and more people to support those on the top — and they're usually the only ones who make money, while the people on the bottom pay. For example, if one person starts a scheme that requires each person joining to recruit 10 others, you'll need 10 million people once you reach the eighth level.

● YOUR letters

Disposable nappy health hazard?

I'm writing to ask for your help regarding the potential health hazards of disposable nappies.

For the August issue of CHOICE you tested disposable nappies using a variety of criteria, all of which I found very useful. I've used disposable nappies on my daughter since she was four months old and I'm pleased with how well they keep her dry. I also find them very convenient.

Now I've read an article in another publication that has made me extremely alarmed. It says that the chemicals sodium polyacrylate (which was apparently removed from tampons to reduce toxic shock syndrome) and dioxin are in disposable nappies, and that these chemicals pose a significant health risk to babies and toddlers. As this angle wasn't mentioned in your recent article, I wonder if it's just alarmist talk to persuade people to use cloth nappies, or if indeed there's a real health problem?

Could you please do some research on this and publish your findings as many of us now are quite worried that we may have damaged or may be damaging our children's health — unknowingly.

Belinda Munro
Via Internet

In our research for the nappies article we came across these claims too — on the websites of those promoting the use of cloth nappies — but we couldn't find any substantiation in the scientific literature for the claim that the chemicals in disposable nappies pose a health risk.

As far as we could establish, there haven't been

any long-term studies of the effects of superabsorbent materials on infants. However, two studies in the early 1990s found that polyacrylate polymers (superabsorbent material) had no toxic effect on the genetic material of laboratory animals, and didn't cause birth defects in them.

Concerning the benefits of nappies containing superabsorbent materials, there's some disagreement. Some studies found that the type of nappy made no difference to nappy rash, but many others have confirmed that disposables with superabsorbent materials have led to drier skin and, hence, less incidence and reduced severity of nappy rash.

As far as dioxins are concerned, they're a family of organochlorines that includes one of the most toxic chemicals yet made. In the past, dioxin traces were found in chlorine-bleached white paper and pulp products, including disposable nappies. However, nowadays nappies are usually oxygen-bleached (using hydrogen peroxide), which forms no dioxin.

Of the manufacturers/distributors of the disposable nappies tested, the following

confirmed their disposable nappies were non-chlorine bleached: Kimberly-Clark (HUGGIES, SNUGGLERS, VIP's), Naelfran (BEBES Ultra), Coles (SAVINGS) and Franklins (NO FRILLS). Amir Paper Products (BABY SITTER) said dioxin was below the detection limit in the pulp of its nappies. The other manufacturers/distributors — Australian Pacific Paper Products (BABYLOVE, COSIFITS, LULLABY), Target (TARGET) and Woolworths (HOME BRAND) — didn't respond to our query in time for publication.

Our daily bread

I wish to address the matter of 'use-by' dates on packaged breads, which are increasingly used now instead of 'baked on' labels. I'm fed up with being charged the full price for a loaf of bread that's already two days old.

The shelf-life of the average loaf of white sliced bread appears to be six days — that's what I've figured out from the labels. In fact, I've only once seen a loaf with six days of its shelf-life still to go. This is why I'm so annoyed. When I purchase bread, its use-by date

is usually only four days out. Why do we have to pay the full price for bread that's already lost two days of its shelf-life?

I think it's really about time this issue was addressed. Supermarkets should be made to provide consumers with bread baked freshly that day. If they then also wish to sell older bread, they should have to keep it separately and display on which day it was baked — and offer it as a sale item. I'm sure it would still sell.

I realise that the big names in retailing have great power, but isn't it high time they were held accountable for what they provide to their customers?

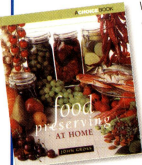
Eva Jurevics
Bilgola Plateau, NSW

Consumers — rightly — want to know when bread is at its freshest, and a 'baked on' label gives this information most unambiguously. However, bread manufacturers can choose one of three options for date-stamping bread labels: a 'use-by' date, a 'baked for' date (baked no more than 12 hours before the date) or 'baked on'.

The industry and research association, Bread Research Institute, says manufacturers most commonly choose a use-by date, and that it's particularly useful for bread that generally lasts longer than seven days, such as rye bread. When bread is delivered to supermarkets, it's often still warm, we were told. Some supermarkets even get it delivered twice daily.

Retailers can keep bread for sale until its use-by date. They aren't required to stop selling or reduce the price of older bread. However, lack of demand may force them to reduce prices. So, keep on checking the labels if you want to buy the freshest.

LETTER OF THE MONTH



We want to hear from you — your experiences help our research and often let other readers know about scams and rip-offs. To thank you for writing to us, Your Letters awards a prize of a CHOICE book to the 'Letter of the month'. This month's winner, Belinda Munro, receives *Food preserving at home*, or any other book of her choice from Consumer Bookshelf pages 40 to 42.

We're sorry we don't have the resources to answer all your letters

personally, and in the magazine we may edit them or print only an extract. See page 2 for how to reach us.

Bring the new year in with a bang!

Whether you're toasting in the last year of the current millennium or the first year of the new one, a great selection of fizz ensures Australians will be doing it in style.

MOST PEOPLE KNOW THE NEW millennium doesn't really start until 2001 — but does anyone care? And just try telling the people who've spent thousands on harbourside parties, round-the-world flights that follow the dawn of the new millennium, luxury travel to small Pacific islands near the International Date Line and the like.

Wine retailers certainly don't mind the prevailing atmosphere of millennium madness: those we've spoken to say that sales so far are double what they've been in previous years. They also point out that people are going more upmarket, buying not just French champagnes, but *top-of-the-line* French.

So, new millennium or not, there's no doubt we'll be sending 1999 off with the bang of millions of champagne corks. For this reason, we tested champagnes and sparkling wines this year — even though we covered them last year. If you'd like more information about how sparkling wine is made and some wine jargon, you'll find it in the last article (CHOICE, December 1998; if you're a new subscriber and don't have that issue, we'll send it to you free of charge — just call Consumer Services on (02) 9577 3399).

What's good

■ Sparkling wines under \$12

On the whole, our expert panel was very impressed with the wines in this bracket: "It's a very strong

bracket, and there's only a couple of wines you couldn't happily drink. There's a lot of what you'd describe as fresh, clean, safe wines, and they're generally good value for money."

Top scorers in this bracket were ORLANDO JACOB'S CREEK Chardonnay Pinot Noir Brut Cuvée and SEAVIEW Gull Rock. Both were admired for their relatively complex nature, considering the price bracket, and were also popular with the lay panel (see *And what about non-experts?*, page 8).

■ Sparkling wines \$12 to \$20

You're likely to see more complexity and better structure as you move up into this bracket.

The pick of this group for the experts was DEUTZ Brut Méthode Traditionnelle Marlborough Cuvée, which was considered very flavoursome, well-structured, and complex. However, some of the lay panel didn't like it.

Second on the list came FLEUR DE LYS Vintage Chardonnay Pinot Noir 1993 — which was also popular with the lay panel. It has a rather different character from the DEUTZ, being far less green and fruity, with warmer, nuttier flavours.

GRANDIN French Méthode Traditionnelle Wine Brut, a French sparkling wine from the Loire Valley (not the Champagne region), came last in the bracket, which just goes to show: all French wine isn't good.

■ Sparkling wines and champagnes over \$20

Most wines in this bracket are characterised by a definite yeasty, toasty, honey aroma developed from long aging on yeast lees in the bottle, as well as a strong flavour that's creamy, round, lasting and complex, but still with a dry ('brut') balance.



PHOTO: VANESSA MARSHALL

IN BRIEF

■ "Australians will be drinking very well for the millennium" — the expert panel's summary of the sparkling wines they tasted.

■ There are some top-value Australian sparklings that cost less than \$30 — see *The CHOICE Mixed Dozen*, page 8.

CHAMPAGNE AND SPARKLING WINES

More froth and bubble?

Try calling an Australian sparkling wine 'champagne' and see how far you get. The French are jealously possessive of the naming rights for their regional varietals, such as burgundy, bordeaux and particularly champagne, and kick up a fuss when others use names that suggest their product might be one of them.

But it cuts both ways: some French wine companies, who labelled their wines 'Australian-style', were told by the Australian Wine and Branding Corporation to remove this reference from the label!

Pricewise, there's a very clear division in this bracket: \$20-\$30, which are all Australian sparkling wines, and \$40+ — all French champagnes.

Best overall were the MOËT & CHANDON Brut Imperial (non-vintage) and the POL ROGER Champagne Brut 1990. They were also clear winners for our lay panellists.

The best of the Australian sparkling wines were CHANDON Vintage Blanc de Blancs 1996, SEPPELT Salinger Méthode Champenoise 1993, SEAVIEW Edwards & Chaffey Méthode Champenoise Pinot Noir Chardonnay 1995 and YARRA BURN Chardonnay Pinot Noir 1996. While they didn't score among the very top wines in this bracket, they outranked the most expensive champagnes in the test: the \$175 DOM PERIGNON Champagne Cuvée Vintage 1992 and the \$165 KRUG Grande Cuvée.

"Australians will be drinking very well for the millennium"

Overall, the expert panel was very impressed with this year's line-up of champagnes and sparkling wines, and was emphatic in its opinion that no matter what your budget, you'll be able to find a good wine to toast the New Year.

And what about non-experts?

Enjoyment of wine is a very personal thing: you may prefer light, dry, 'aperitif-style' wines; full-bodied fruity ones; heavy, yeasty, mushroomy ones; or complex wines with a multitude of identifiable flavours and aromas.

Our expert tasters have been trained to ignore personal preferences and simply look for wines that are well-made with no particular problems or faults.

We asked a lay panel to taste some of the wines the experts rated well, rated poorly and couldn't decide on (see *Mixed emotions* in note 2, below right).

In general, there was good agreement between the lay panel's and experts' opinions. The main exceptions were the **DEUTZ Brut Méthode Traditionnelle Marlborough Cuvée**, which the experts rated very highly and the lay panel fairly low, and the **ANGAS BRUT Premium Cuvée**, which the experts rated poorly and the lay panel quite highly. The lay panel's scores aren't included in the final scoring in the table for the wines.

So when you're choosing one of the sparkling wines or champagnes listed in the table, go for the ones the experts rated well, but also look at the tasting notes and choose those that match the style you prefer.

THE CHOICE MIXED DOZEN



The CHOICE Mixed Dozen features the top wines from each price bracket — the top two from the cheaper brackets and top four from the most expensive. We've also included the four Australian sparkling wines that scored well in the most expensive bracket because they represent good value for money.

\$12 or less

ORLANDO JACOB'S CREEK Chardonnay Pinot Noir Brut Cuvée	\$9.80
SEAVIEW Gull Rock	\$9.52

Between \$12 and \$20

DEUTZ Brut Méthode Traditionnelle Marlborough Cuvée	\$21.28*
FLEUR DE LYS Vintage Chardonnay Pinot Noir 1993	\$15.39

More than \$20

MOËT & CHANDON Brut Imperial (non-vintage)	\$59.37
POL ROGER Champagne Brut 1990	\$60.60
LOUIS ROEDERER Brut Premier (non-vintage)	\$62.75
VEUVE CLICQUOT Ponsardin Champagne Brut (non-vintage)	\$62.33
CHANDON Vintage Blanc de Blancs 1996	\$28.39
SEPPELT Salinger Méthode Champenoise 1993	\$23.82
SEAVIEW Edwards & Chaffey Méthode Champenoise Pinot Noir Chardonnay 1995	\$23.60
YARRA BURN Chardonnay Pinot Noir 1996	\$22.72

\$\$ Denotes good value in this price bracket and/or in the Mixed Dozen.

* While this was the average of the prices found, it was very often available for under \$20, so shop around for a good price.

Mousse and bead ... or froth and bubble

You can tell a lot about a champagne or sparkling wine simply by looking at it. Poorer-quality sparklings have large, aggressive bubbles like soft drink. Better-quality sparklings (*méthode champenoise*) and champagnes have a persistent and fine bead that slowly trickles to the surface.

Good champagnes and sparkling wines also have a creamy mousse: a delicate head of foam or froth around the edge of the surface of the wine. A full head probably means the glass is soapy or dirty.

A scientist called Bill Lembeck went to the trouble of calculating how many bubbles are in one bottle of champagne, and came up with 49 million. The following tips will help you enjoy as many of the 49 million as possible:

- Serve champagne cold, but not from the freezer (if it's too cold the flavour will be suppressed). Put it in the fridge for a couple of hours, or in a bucket of ice and water for 30 minutes.
- Shooting the cork from the bottle may look and sound impressive, but you'll lose some of the fizz — not to mention some of the wine. Hold the cork while slowly twisting the bottle, and gently ease the cork out.
- Serve it in long-stem tulip or flute-shaped glasses — it concentrates the aroma and makes the bubbles last longer.
- The glasses must be clean (no detergent residues) and it helps if they're cold (even refrigerated).
- Tilt the glass and pour the wine against the side, not down into the centre.
- If the glasses aren't cold, pour a little into each glass, which will cool the glass down as it froths and foams. You can then top them up later.
- Keeping it cold after opening will help preserve the bubbles, so use an ice bucket or wine cooler.
- If resealed (with an ordinary wine-bottle cork or a special champagne bottle sealer) and refrigerated, it should keep for several days.

Is there any point buying a millennium memento?

As a rule, champagnes and sparkling wines are ready to drink by the time they reach the retailer — they won't necessarily improve with age, and often deteriorate over time.

So when you buy these wines, go to a shop with a good turnover, where you can be confident that it hasn't been languishing on the shelves for too long. And if it's standing on a shelf in direct sunlight, don't buy it.

There's little point trying to buy and save a millennium bottle of champagne for later drinking: you won't be able to buy 1999 vintages for a couple of years at least, and when they do hit the shelves, they'll be ready for drinking at that time. If you want an investment bottle, stick with a good red.

MANY THANKS TO OUR EXPERT PANEL



Tony Jordan,
winemaker, Wirra Wirra



Peter Bourne,
wine consultant



Jon Osbeiston,
wine retailer



Ed Carr, winemaker,
BRL Hardy



David Wollan,
wine consultant



Ian Cook,
wine retailer

PHOTOS: VANESSA MARSHALL

Table notes (for the table overleaf)

1 Additives

All the champagnes and sparkling wines have sulphur dioxide (220) added to them, except for **POL ROGER Champagne Brut 1990**, which has no additives stated, and **NORMANS Brut Cuvée**. It prevents browning of the grapes and acts as a preservative. Many asphaticams are sensitive to sulphur dioxide and it could cause an attack. As a rule, champagnes and sparkling wines contain less sulphur dioxide than still white wines, because the carbon dioxide is a natural preservative.

NORMANS Brut Cuvée contains 202 (potassium sorbate), a preservative that has no known adverse health effects.

Other additives include ascorbic acid (300), sodium ascorbate (301) and erythorbic acid (315), which are added to prevent browning.

2 Score

Each expert gave the wine a score out of a maximum of 20: 3 for appearance, 7 for 'nose' and 10 for 'palate' (a widely used show-scoring system for wines).

Because of the wide range of scores for some of the wines (even after taking out those classified as 'mixed emotions' — see below), we used the median (the middle score) rather than the average. This means that any outlier scores don't distort the overall score.

Where the range of expert scores was too large, the wine was called a *Mixed emotion* — that is, the experts couldn't agree. If you're the adventurous type, read their tasting notes to see whether any of them might be your style.

The panel didn't know which wine they were tasting, but they did know which price bracket it was in. The scores are only comparable within, not between, the three price brackets.

3 Tasting notes

These are compiled from the expert panel's notes. Combined with the scores, they should give you a good indication of the wines' aroma and flavour.

CHAMPAGNE AND SPARKLING WINES

Target
price
(\$)*

1

2

3

Origin Additives Score Tasting notes

UNDER \$12 (in rank order)

ORLANDO JACOB'S CREEK Chardonnay Pinot Noir Brut Cuvée	9.80	Australia	220, 300	16	Pale yellow colour; earthy, smoky, nutty aroma; fine structure, good depth of flavour — "some good méthode champenoise characteristics"
SEAVIEW Gull Rock	9.52	Australia	220, 315	16	Pale lemon colour; smoky, yeasty, nutty aroma; good balance, flavour and richness — "a wine with some genuine character"
ORLANDO Carrington Vintage Brut Special Cuvée 1998	7.04	Australia	220, 300	15.5	Medium straw colour; nutty, yeasty, breadly aroma; yeasty complexity, firm, dry finish — "has something to offer the mouth"
QUEEN ADELAIDE Woodley Brut	6.78	Australia	220, 315	15.5	Light straw colour; fruit, melon and lolly aromas; sweet, some character, a little short — "light, simple style but well made"
ANDREW GARRETT Brut NV Pinot Noir Chardonnay	12.24	Australia	220, 300	15	Pale salmon pink colour; strawberry, confectionery aroma; soft, creamy, slightly sweet, a little hard on the finish — "simple, clean rosé style"
BAIROCK STATION Sparkling Chardonnay	10.70	Australia	220, 300	15	Pale straw colour; light, fresh, citrus, herbaceous aroma; bright, youthful, zippy palate — "fresh and simple with some flavour and style"
GLASS MOUNTAIN Classic Brut	8.76	Australia	220, 315	15	Green-yellow colour; soft, fruity, herbaceous aroma; light, sweet, aromatic palate — "quite muscaty and aromatic — a different style from the others"
KILLAWARRA Brut	9.00	Australia	220, 315	15	Medium yellow colour; fresh, yeasty aroma; soft, fuller style, a little green on finish — "good style, good value"
MINCHINBURY Brut Private Cuvée	5.68	Australia	220, 315	15	Pale yellow colour; green, herbaceous, very fresh nose; soft, clean and green acid — "good honest style with some flavour"
NORMANS Brut Cuvée	6.88	Australia	202, 301	15	Buttercup colour; honey, toasty, caramel nose; sweet, cloying, oily, good mousse — "a wine of character"
OMNI NV	9.46	Australia	220, 300	15	Medium straw colour; chardonnay, peach aroma with nice fruit balance; good flavour, zippy palate — "personality, length and style"
SEPPelt Great Western Imperial Reserve	6.60	Australia	220, 315	15	Medium straw colour; soft, almond, lemon, floral, complex/confused aromas; soft, a little broad, fair length — "good commercial style with some flavour and freshness"
BLUES POINT Brut Reserve	10.08	Australia	220, 300	14.5	Pale yellow colour; honey, grassy, semillon nose; soft, broad, dull palate — "safe, easy drink"
SEAVIEW Brut	7.72	Australia	220	14.5	Medium straw colour; aged, buttery, aldehydic, woody aroma; broad, full and sweet palate — "lots of character but clumsy"
SEPPelt Great Western Brut Reserve	6.51	Australia	220, 315	14.5	Pale yellow colour; fresh, citrus, aromatic; simple, bright, fresh palate — "clean, well made but simple"
SEPPelt Great Western Grande Reserve	6.56	Australia	220, 315	14	Pale yellow colour; simple, soft and bland aroma; lively, fruity, simple and sweet palate — "a bit sweet, but good commercial style"
ANGAS BRUT Premium Cuvée Pinot Noir Chardonnay	7.77	Australia	220, 300	13.5	Deep straw colour; aldehydic, sweaty-socks nose; short, simple, very dry and hard finish — "not attractive"
COCKATOO RIDGE Brut NV	9.90	Australia	220, 300	13.5	Burnished yellow colour; raspberry, lollyish, aldehydic nose; sour, green, volatile palate with a hard finish — "oxidised, hard and clumsy"

MIXED EMOTIONS (in alphabetical order)

MINCHINBURY White Seal Private Cuvée	5.79	Australia	220, 315	13.5 – 17	Light straw colour; aromatic, nutty, lemony, honey nose; some length and complexity but broad — "simple, broad, dry — commercial style"
RICHMOND GROVE Chardonnay Pinot Noir NV Brut	11.48	Australia	220, 300	13 – 18	Medium lemon colour; earthy, yeasty, nutty, burnt rubber, sulphur; good structure, rich, generous — "good structure, good style, good value"
SEAVIEW Champagne Grande Cuvée	7.50	Australia	220	14 – 17.5	Deep straw colour; lemon, cigar, bread-dough aroma; nice structure, age and complexity, flat and green — "for someone who likes a medium-dry style"
YELLOWGLEN Yellow	11.75	Australia	220, 300	14 – 17.5	Deepish straw colour; yeasty, earthy, doughy, strawberry aromas; full-flavoured, creamy, needs freshness — "very good for this bracket"

\$12 TO \$20 (in rank order)

DEUTZ Brut Méthode Traditionnelle Marlborough Cuvée	21.28 (A)	NZ	220, 300	17	Light straw colour; toasty, green fruit, yeast aromas; zesty, round, dry, plenty of flavour — "very lean aperitif style"
FLEUR DE LYS Vintage Chardonnay Pinot Noir 1993	15.39	Australia	220	16.5	Medium straw colour; breadly, nutty, aldehydic, complex aroma; rich, full, broad palate with a crisp mousse — "quite stylish and generous"
ANDREW GARRETT Vintage 1996	16.90	Australia	220, 300	16	Pale lemon colour; cashew, vanilla, simple fruit aromas; full-bodied, dry, a little bland — "aperitif style"
SEAVIEW Chardonnay Vintage Reserve Blanc de Blancs 1995	16.21	Australia	220	16	Mid-yellow colour; toasty, melon, bread and strawberry aromas; full, developed, rich palate — "well made, but lacking complexity"
WOLF BLASS Brut	12.39	Australia	220, 300	16	Deep straw colour; honey, creamy, buttery aromas; full-bodied, rich, short and simple palate — "aperitif style"
WOLF BLASS Vintage Pinot Noir Chardonnay 1996	16.64	Australia	220, 300	16	Pale green-yellow colour; young, fruity, citrus aroma; fresh and lively, no distinguishing character — "a bit underdeveloped"
YELLOWGLEN Y	19.52	Australia	220, 300	16	Light lemon colour; yeasty, light chardonnay fruit aroma; structure round and complex, finish a little hard — "slight but complex"
ORLANDO Trilogy Cuvée Brut Pinot Noir Chardonnay Pinot Meunier	13.38	Australia	220, 300	15.5	Medium straw colour; nutty, fresh stone-fruit aroma; light, clean, hard finish — "commercial, aperitif style"
TALTARNI Cuvée Brut Chardonnay Pinot Noir	15.70	Australia	220	15.5	Pale yellow colour; herbaceous, apple, marzipan, gun-flint aromas; one-dimensional, fresh acid palate — "lacks depth and flavour"
YELLOWGLEN Pinot Noir Chardonnay Brut	14.92	Australia	220, 300	15.5	Pale yellow colour; light, youthful, citrus aroma; very fresh, acidic style — "light and fresh but a bit hard"
YELLOWGLEN Vintage Brut 1996	19.51	Australia	220, 300	15.5	Pale straw colour; lime, melon, green aromas; green acid, young and fresh palate — "good, young, aperitif style"
GRANT BURGE Pinot Noir Chardonnay Brut	18.17	Australia	220	15	Light lemon colour; melon, lemon, weak, simple aroma; clean, crisp acid, lacks length — "tends towards the previous class"

CHAMPAGNE AND SPARKLING WINES,
continued

	Target price (\$)*	Origin	1 Additives	2 Score	3 Tasting notes
SEAVIEW Pinot Noir Chardonnay Vintage Reserve Brut 1996	16.66	Australia	220, 315	15	Medium yellow-gold colour; bread, aldehyde, musk aromas; overdeveloped, oxidised, broad and clumsy palate — "aldehyde-driven style"
THIRSTY FISH Chardonnay Brut	13.36	Australia	220, 315	15	Pale lemon colour; fruity, simple, dull aroma; simple, fruity, sweet palate — "basic"
GRANDIN French Méthode Traditionnelle Wine Brut	13.99	France	220, 300	14	Pale lemon colour; oily, unpleasant aroma like hand cream; sweet, dry and straight — "oily, broad and ugly"
MIXED EMOTIONS (in alphabetical order)					
BLUE PYRENEES Estate Reserve Brut	21.92 (A)	Australia	220, 300	12 – 16.5	Pale yellow-bronze colour; apricot, strawberry, volatile, dirty, stewed-fruit aroma; short and clumsy palate — "had a winemaking fault"
BROWN BROTHERS PNC Brut Non Vintage King Valley	15.74	Australia	220, 300	13 – 16.5	Medium lemon colour; nutty, yeasty, custard-apple aroma; full-flavoured with yeast complexity, good balance — "sparkling still wine"
SIR JAMES Cuvée Brut PNC	12.97	Australia	220, 300	12.5 – 16.5	Bronze-yellow colour; toasty, nutty, caramel aroma; good, creamy mousse, developed flavours, broad, flat and dull — "loads of flavour, lacks style"
\$20 PLUS (in rank order) **					
MOËT & CHANDON Brut Impérial	59.37	France	220	18	Lemon straw colour; lovely biscuity yeast aroma, cracked and toasty and fresh at the same time; rich good structure, length, age and complexity — "a classic"
POL ROGER Champagne Brut 1990	60.60	France	ns	18	Medium straw colour; yeast, dough, biscuit aromas; rich and round with balance and length — "stylish, elegant wine"
LOUIS ROEDERER Brut Premier	62.75	France	220	17.5	Mid-yellow colour; nutty, yeast, aldehyde aromas; full, toasty complex palate, firm, persistent finish — "big, bold and beautiful"
VEUVE CLICQUOT Ponsardin Champagne Brut	62.33	France	220	17.5	Pale lemon colour; chalky, malolactic, smoky, yeasty aromas; solid, complex structure — "nice, easy, creamy"
BILLECART-SALMON Brut Réserve	63.45	France	220	17	Light straw colour; yeast, lemon, melon aromas; palate fresh and zingy — "sweet and sour"
BOLLINGER Champagne Grande Année 1990	102.79	France	220	17	Deep straw colour; toasty, buttery, nutty, rich aromas; big, full, flavoursome, long — "rich and extravagant"
POL ROGER Champagne Brut	53.15	France	220, 300	17	Medium straw colour; vanilla, citrus, yeast aromas; creamy mousse, rich, round, fruity — "zesty, clean and long"
BOLLINGER Champagne Spécial Cuvée Brut	65.25	France	220	16.5	Mid-lemon colour; dusty, yeast, citrus, aldehyde aromas; yeasty and doughy, good mousse, long palate — "good classic champagne style"
CHANDON Vintage Blanc de Blancs 1996	28.39	Australia	220	16.5	Mid-yellow colour; toffee, bread, aldehyde, stone-fruit aromas; sweet and complex with firm finish — "nicely developed old-style wine"
MOËT & CHANDON Champagne Brut Impérial Vintage 1993	85.11	France	220	16.5	Vibrant lemon colour; lemon, nutty, earthy aromas; creamy, complex palate with good flavours — "zesty, fresh and clean"
PIPER HEIDSIECK Champagne Brut Millésime 1990	70.99	France	220, 300	16.5	Light straw colour; toasty, oily, doughy, fishy aromas; aromatic and pungent, fresh and lively palate — "complex, stylish, generous"
SEPPELT Salinger Méthode Champenoise 1993	23.82	Australia	220	16.5	Medium straw colour; apple, lemon, nutty, restrained aromas; lacks depth and intensity — "nice, attractive brut"
SEAVIEW Edwards & Chaffey Méthode Champenoise PNC 1995	23.60	Australia	220	16.5	Pale yellow colour; hessian bags, yeast, mushroom aromas; sweet, soft, generous palate — "simple but attractive"
YARRA BURN Chardonnay Pinot Noir 1996	22.72	Australia	220, 300	16.5	Yellow-gold colour; toasty, floral, honey, nutty aromas; rich palate but a bit short — "safe drinking"
BROWN BROTHERS Pinot Chardonnay Brut Whitlands 1994	31.88	Australia	220	16	Light honey colour; some yeast, floral, toast, cashew aromas; rich, soft palate and good mousse, reasonable length — "simple but still a good drink"
CHANDON Vintage Brut 1996	30.69	Australia	220	16	Deep gold colour; complex aroma, aged but lacks life; good mouth feel, richness marred by bitter finish — "flavoursome drinking"
DOM PERIGNON Champagne Cuvée Vintage 1992 (B)	175.86	France	220	16	Pale straw colour; honey, spice, lemon, biscuit, marzipan, mushroom aromas; aromatic style, lacks complexity — "good, but needs more 'oomph'"
KRUG Grande Cuvée	164.57	France	220	16	Straw/bronze colour; honey, broiche, aldehyde and some yeast; not a lot of substance, a touch short — "bags of character but not an easy drink"
SIR JAMES Vintage 1994	22.59	Australia	220, 300	16	Mid-yellow colour; aged vanilla, peach, floral aromas; very dry yet full, some botrytis — "old-fashioned style, lots of flavour"
JANSZ Tasmania Brut Premium NV Cuvée	28.35	Australia	220, 300	15.5	Light straw colour; pear, citrus, floral, eucalyptus aromas; elegant with good length but lacking complexity — "good commercial wine"
YALUMBA D Méthode Champenoise Vintage 1996	26.02	Australia	220	15.5	Pale lemon colour; fresh, apple, citrus, green aromas; palate broad, lacks complexity — "simple and clean"
MIXED EMOTIONS (in alphabetical order)					
LAURENT-PERRIER Champagne Brut LP	56.47	France	220	15 – 18.5	Pale lemon colour; very aromatic, nutty aromas; full and flavoursome but hardness stops finish — "fine and elegant"
POMMERY Champagne Brut Royal	52.29	France	220, 300	14.5 – 18	Pale yellow colour; light honey, yeast aromas; light fresh style, broad complex palate — "tight and complex", "simple quaffing"
VEUVE CLICQUOT Ponsardin Champagne Brut Vintage Réserve 1991	87.99	France	220	14 – 18.5	Lemon yellow colour; toffee, toast, dough, strawberry, mushroom aromas; bitter, sweet, crisp palate with good depth — "a style you like or don't like"

NV Non-vintage

PNC Pinot noir chardonnay

ns None stated

* Prices shown are the average price from nationwide checks in July 1999.

** For many champagnes, the only difference in names and labels between vintage and non-vintage versions is the addition of a year — not always in large print. So check carefully that you've got what you're really looking for when buying.

(A) While this was the average of the prices found, this wine was very often available for under \$20, so shop around for a good price.

(B) Technically, this wine is a product of Moët and Chandon. To avoid confusion, we've used the more easily recognised name.

Going crackers!

*Is it worth forking out \$40 for a box of Christmas crackers?
Or will a \$2 box be just as much fun?*



- 1 David Jones 6-pack, \$39.95 (\$6.66 per cracker). Hats: paper. Gifts: quality gifts for adults.
- 2 Tom Smith 12-pack, \$24.95 (\$2.08 per cracker). Hats: paper. Gifts: fun toys and games.
- 3 Santa's Helper 12-pack, \$6.99 (58 cents per cracker). Hats: plastic. Gifts: small plastic toys.
- 4 Santa's Helper 8-pack, \$2.99 (37 cents per cracker). Hats: plastic. Gifts: small plastic toys.
- 5 Christmas Trim 8-pack, \$2.98 (37 cents per cracker). Hats: plastic. Gifts: small plastic toys.
- 6 Terra Nova 6-pack, \$12.95 (\$2.16 per cracker). Hats: paper. Gifts: fill them yourself.

IN BRIEF

■ Choosing Christmas crackers is pretty hit and miss unless you're prepared to pay \$6 or more per cracker. Some look good but have uninspiring presents; some contain interesting toys while others just give you disappointing rubbish. Use this CHOICE guide for a glimpse inside the wrappings before you buy.

IT'S LUNCHTIME ON CHRISTMAS DAY. The table's groaning, the family's ready to dig in. But first comes the age-old ritual of pulling the crackers. You've chosen bright, Christmassy ones and the kids love them. They grab hold, pull and ... Oh, no!

The crackers almost fall apart in the kids' hands, there's a dull pop from the few that actually go off, the hats are plastic, the jokes are terrible and — worst of all — there aren't any gifts.

To make sure this doesn't happen to you, we trialled 14 crackers (all widely available in supermarkets and department stores) for pull, contents and appeal. There's no ideal cracker for every occasion, so the trialists chose a selection for different occasions, ages and budgets.

For adults

Planning a gathering for a small group of adults? They probably won't be that excited by traditional crackers with run-of-the-mill plastic animals and magic string tricks inside. But the DAVID JONES 6-pack, which contains good-quality gifts such as a smart-looking chrome eggcup, might exceed even the most discerning expectations. At \$6.66 per cracker, these were the most expensive in the trial, but the trialists felt they were worth it: "You'd actually want to keep some of these gifts!"

Fun pack

If you're looking for crackers to keep a mixed group entertained, try the TOM SMITH 12-pack. Our trialists were impressed by the varied, interactive gifts, which they felt would amuse both kids and adults. Overall, these crackers were "good value for a family dinner", even at \$2.08 each.

Table brighteners

If you want attractive crackers to brighten up your table but don't want to spend too much, the SANTA'S HELPER 12-pack could be just the ticket. They're only 58 cents a pop. While they look great, though, all the ones we opened had uninspiring plastic toys.

Budget beaters

If you've a large family and a small budget, there's probably not that much left over for crackers after buying gifts and food. So you'd be looking for cheap

crowd pleasers. We'd recommend SANTA'S HELPER 8-pack or CHRISTMAS TRIM 8-pack: both cost only 37 cents a cracker. They're the cheapest crackers in the trial that still contained gifts.

Add your own gift

Looking for something a bit different? You could try the personal touch by filling some TERRA NOVA 6-pack crackers yourself. They come complete with jokes, hats and snaps, so all you've got to add is the gift. The trialists liked their look, though they're a bit expensive at \$2.16 each. As one said, "If you had a lot of time and could be bothered to fill them, these could be quite special."

And the duds...

None of the other crackers appealed much: some were hard to pull, while others had disappointing contents.

The two cheapest crackers, the COLES 8-pack and SANTA'S HELPER 6-pack (25 cents and 27 cents each respectively) had no gifts. "I'd be cranky to find no toy," commented one trialist, and another asked, "Why bother?"

The gifts in the KMART 6-pack were particularly uninspiring: we opened 10 crackers and only found plastic paper clips, turtles and magnifying glasses.

Are they safe?

Most of the boxes of crackers contained small hazards, such as toys kids could choke on; and many didn't carry a satisfactory warning label.

The BIG W 6-pack was particularly worrying — one of the trialists pricked her finger on a needle (opening a sewing kit), while another found sharp scissors. These gifts are fine for adults, but you wouldn't want your three-year-old getting hold of them. □

- 
- 7** Target Deluxe 6-pack \$20.00 (\$3.33 per cracker).
Hats: paper. Gifts: practical gifts.
 - 8** Big W 6-pack, \$13.97 (\$2.33 per cracker).
Hats: plastic. Gifts: practical toys.
 - 9** David Jones 10-pack, \$19.95 (\$2.00 per cracker).
Hats: paper. Gifts: games and toys.
 - 10** Magic 6-pack, \$9.95 (\$1.66 per cracker).
Hats: paper. Gifts: games.
 - 11** KMart 6-pack, \$7.95 (\$1.33 per cracker).
Hats: paper. Gifts: plastic toys (mostly the same ones in different crackers).
 - 12** Target 12-pack, \$16.00 (\$1.33 per cracker).
Hats: paper. Gifts: toys and small practical gifts.
 - 13** Santa's Helper 6-pack, \$1.59 (27 cents per cracker).
Hats: plastic. Gifts: none.
 - 14** Coles 8-pack, \$1.97 (25 cents per cracker).
Hats: paper. Gifts: none.



The prices are those we paid in October this year.

Beach sun shelters are light, portable and easy to set up — and most provide excellent UV protection. But some won't last the distance and others are poorly designed.

Beating the sun and sand ...



IN BRIEF

■ Nearly half of these beach sun shelters meet their claim of a UV protection factor (UPF) of 50+, giving you excellent protection from harmful UV radiation. The others still provide very good or even excellent protection, but have lower UPFs than claimed.

■ 'Pop-up' shelters are very easy to use. Those with an external frame take a little longer to set up and take down.

OK, YOU'VE GOT THE DOPE ON SUNGLASSES (CHOICE, October 1999) and sunscreens (November 1999) — now here's our latest on summer paraphernalia to help you avoid sunburn and skin damage while enjoying your leisure time.

UV protection

During summer it's best to avoid exposing our skin to more than 10–12 minutes of direct midday sun without protection. While shade can give relief from the sun's heat, it only provides limited protection against harmful ultraviolet (UV) radiation. So you can get sunburnt after less than an hour if you're fair-skinned, even if you shelter under a tree or beach umbrella.

A beach sun shelter can provide much better protection from UV radiation. It's dome-shaped and usually has side and rear walls, reducing the amount of direct, scattered and reflected UV radiation. The less UV that gets through the material, the higher its

ultraviolet protection factor (UPF) — see *UPF and UV radiation*, page 17, for details.

All the 11 beach sun shelters tested claim to have a UPF of 50+, which should give you excellent protection from harmful UV radiation, but only five actually meet that claim. The others are made of material that still provides very good or even excellent protection, but they have lower UPFs than claimed, probably because the material is slightly different from the sample manufacturers submitted for UPF rating. The slightest variations in the weave, the stretching of the material or its colour can all affect the UPF. And the UPF of the material isn't everything — see *UPF and UV radiation*.

Light, portable and easy to set up

Unlike larger models intended for your garden (see CHOICE, December 1998), beach sun shelters are smaller and much more portable. They come in carry bags with one or two straps and are light enough to be carried over your shoulder or on your back. They fit two or three adults sitting up and their beach bags.

They're also pretty easy to set up. The more common type simply 'pops up'; another type is hung from an external frame, similar to an igloo tent used for camping. In terms of stability, space and comfort, neither type is particularly superior — it boils down to the design of the individual model.

However, the **pop-up** type has the edge in ease of setting up within a minute or two. You just take it out of the carry bag and it springs into shape (it has a flexible spring-steel frame). Then you fill the outside pockets along the base of the walls with sand to anchor it.

WHAT TO BUY

All the beach sun shelters tested are made of material that provides very good or excellent protection from UV radiation, but many have a problem with their design (see *What about the rest, right*, for details). That leaves one external frame shelter and three pop-up models in the *What to buy* list.

External frame

SPORTIVA Beach Dome Tent \$89

Pop-up

COUGAR BCSEF (family) \$139

SHELTA Beach Shelter (small) \$89

SHELTA Beach Shelter (large) \$100

Profiles are of the models in the *What to buy* list, in rank order from left to right. Prices shown are a good target to aim for when shopping around, based on nationwide checks in October 1999. Anything lower is a bargain.

To pull it down, you literally just bend it till it 'springs' closed, and pop it back into the carry bag. You may have seen people at the beach struggling with one, but once you've got the knack of it, it's quick and easy. Just follow the instructions or folding diagram printed on the carry bag.

If you're used to the simplicity of a pop-up shelter, you probably wouldn't want to swap it for an external frame shelter, which is more involved to set up. It has an external frame of two flexible, folding fibreglass poles. You either thread the poles through sleeves in the cover material, or attach them with plastic clips. As with the pop-up shelters, you fill sand pockets to anchor the shelter.

It's not difficult to assemble and take down, but it takes longer than the pop-up type. To put it back into its bag you have to roll it up on the beach, which means you'll probably collect some sand as well.

What about the rest?

All the other models tested had some problems, mainly associated with poor design.

■ The two **OUTDOOR FASHIONS** shelters scored poorly for durability: their material lost 75% of its strength under prolonged exposure to UV light. In addition, to enable them to withstand even a light wind, you have to tie the additional sand pockets to the walls. They have ventilation screens on the side walls that let in a lot of UV radiation.

■ All four **SMART SHADE** models suffer from design flaws. The rear wall of the **\$5600** (polyester) shelter is too long for its frame and flaps around in the wind; it has no sand pockets along that wall. There's a short, thin metal peg provided, but it has little effect in sand.

The **\$5600** (nylon) has the same problem with the rear wall, and on the **\$5800** the floor is too long, but at least they have sand pockets for anchorage. And the front top part of the **\$5400** comes down too low, which can obstruct your vision, so it could be difficult to keep an eye on the kids or just watch the passing parade.

■ While the **TIMBERLINE** shelter material scored well for durability, there are no side 'walls', providing very little protection from the sun. It also scored poorly for ease of use, and was quite flimsy and unstable even in light winds.



SPORTIVA Beach Dome Tent

Type: External frame

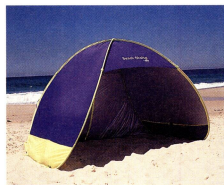
Target price: \$89

Good points

- Excellent UV protection.
- Good-sized usable shelter.
- Good durability.
- Has a floor.
- Zippered side access panels can be pegged out as awnings.

Bad points

- Takes longer to put up and take down than pop-up shelters.
- No internal storage pockets.
- Gets covered in sand if rolled up on the beach.



SHELTA Beach Shelter (small)

Type: Pop-up

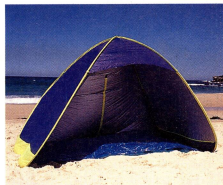
Target price: \$89

Good points

- Very good UV protection.
- Easy to put up and pull down.
- Good stability.
- Easy to use.
- Has internal storage pockets.

Bad points

- Among the worst for durability.
- Small.
- No floor.



COUGAR BCSEF (family)

Type: Pop-up

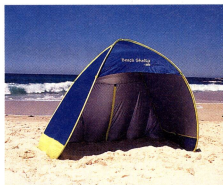
Target price: \$139

Good points

- Excellent UV protection.
- Good-sized usable shelter.
- Easy to put up and take down.
- Very easy to use.
- Has a floor.
- Has internal storage pockets.

Bad points

- Among the worst for durability (resistance to degradation after prolonged exposure to UV light).
- No sand pockets on rear wall.



SHELTA Beach Shelter (large)

Type: Pop-up

Target price: \$100

Good points

- Very good UV protection.
- Easy to put up and pull down.
- Easy to use.
- Has internal storage pockets.

Bad points

- Only average durability.
- No floor.

Brand / model (in rank order by UPF*)	Manufacturer / distributor	Origin	Target price (\$)*	Warranty (years)	Weight (kg)	Base area (cm)***	Style
SPORTIVA Beach Dome Tent	L E Whittaker	China	89	1	2.9	205 x 205	External frame
COUGAR BCSEF (family)	BBQs Galore	China	139	1	4.0	240 x 150	Pop-up
SHELTA Beach Shelter (small)	Shelta Australia	China	89	1	2.9	220 x 120	Pop-up
SHELTA Beach Shelter (large)	Shelta Australia	China	100	1	3.2	230 x 140	Pop-up

The following models had problems, mainly associated with poor design and/or durability (see *What about the rest?* on page 15 for details).

OUTDOOR FASHIONS Twist Shelter (medium)	Auto Fashions Australia	China	89	1	2.5	155 diameter	Pop-up
OUTDOOR FASHIONS Twist Shelter (family)	Auto Fashions Australia	China	130	1	3.3	180 diameter	Pop-up
SMART SHADE SS600 Sunshelter (polyester) (A)	Sitro Group	China	89	1	2.6	205 x 135	Pop-up
TIMBERLINE Regal Sun Dome	Big W Discount Stores	China	70	(B)	2.3	190 x 190	External frame
SMART SHADE SS400 Sunshelter (small)	Sitro Group	China	69	1	2.5	220 x 120	Pop-up
SMART SHADE SS800 Sunshelter (family)	Sitro Group	China	119	1	4.1	220 x 145	Pop-up
SMART SHADE SS600 Sunshelter (nylon) (A)	Sitro Group	China	89	1	2.9	195 x 130	Pop-up

WHAT TO LOOK FOR

Beach sun shelters are available from major department stores, camping and sporting stores. While you can't check their durability in the shop, you can consider the following points.

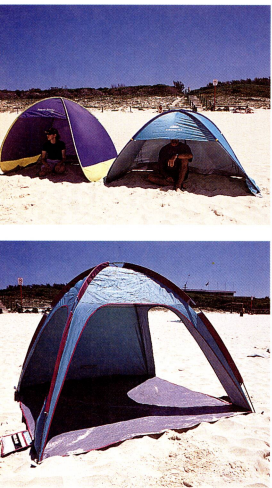
Size and design

■ In its **carry bag**, the shelter should be compact, light and comfortable to carry. Two backpack-type straps are better, as they leave both your hands free. Instructions or folding diagrams printed on the carry bag are useful.

■ **Larger models** give you more room to stretch out and for your bags.

■ Choose a shelter that gives you **plenty of cover**. Sides that are open or have permanent windows may let a breeze in, but they also let in a lot of reflected UV radiation. Zippered side or rear panels are better, as you can open them for ventilation when the sun's coming from another direction.

The front of the Smart Shade SS400 (above left) is too low, blocking your view out. As the model next to it shows, there's no good reason for this design. Open-sided shelters like the Timberline (left) may give you the benefit of breezes, but they considerably increase your exposure to scattered and reflected UV radiation.



Features

■ Look for large **sand pockets** on all walls to help anchor the shelter. The pockets should extend along the full length of the walls. Pegs may be useful for added stability, but look for large **plastic pegs** — thin metal ones are less effective in the sand.

■ **Storage pockets**, particularly zippered ones, are useful on the inside walls for storing small items.

■ If it has a **floor**, you're less likely to get sand all over your things or lose smaller items in it. People or bags sitting on the floor can also improve a shelter's stability in windy conditions. Not sure whether you want a floor? Some models come without, while with others you have the option to attach one.

When you're out on the beach ...

Two out of three people who live in Australia all their lives will get some kind of skin cancer. The most common cause is exposure to UV radiation, but appropriate protection can help you reduce the risk.

So when you're out on the beach, don't just rely on a sun shelter for protection. To reduce the harmful effects of the sun's UV radiation, also:

■ Minimise your exposure, especially between 11 am and 3 pm (daylight saving time), when the sun is strongest.

■ Wear a wide-brimmed hat, clothing like (at least) a t-shirt and shorts when you're not swimming, and sunglasses that meet the Australian standard — for more information see CHOICE, October 1999.

■ Apply a broad-spectrum SPF 30+ sunscreen to the unprotected areas of your body, reapply it regularly (especially after swimming) and don't skimp on the amount you use — for more information see CHOICE, November 1999.

	2	3	4	5	6	
over material	Floor	Storage pockets	Ease of use score (%)	Durability score (%)	UPF *	Brand / model (in rank order by UPF*)
polyester UVTEX2000	✓		70	60	50+	SPORTIVA Beach Dome Tent
ylon	✓	✓	78	35	40	COUGAR BCSEF (family)
ylon		✓	76	35	25–35	SHELTA Beach Shelter (small)
ylon		✓	74	45	25–35	SHELTA Beach Shelter (large)
ylon / polyester	✓	✓	65	25	50+	OUTDOOR FASHIONS Twist Shelter (medium)
ylon / polyester	✓	✓	65	25	50+	OUTDOOR FASHIONS Twist Shelter (family)
polyester		✓	68	52	50+	SMART SHADE SS600 Sunshelter (polyester) (A)
NOT nylon	✓		50	77	50+	TIMBERLINE Regal Sun Dome
polyester		✓	70	45	40	SMART SHADE SS400 Sunshelter (small)
polyester	✓ (detachable)	✓	71	49	30	SMART SHADE SS800 Sunshelter (family)
ylon		✓	76	43	30	SMART SHADE SS600 Sunshelter (nylon) (A)

* UPF (ultraviolet protection factor); see below right for details.

** Prices shown are a good target to aim for when shopping around, based on nationwide checks in October 1999.

*** The roof area doesn't necessarily cover the whole of the base area.

(A) There are two Smart Shade SS600 sun shelters, one made from polyester, the other from nylon.

(B) Big W/Woolworths money-back policy.

1 Style

For a description of the two types, see *Light, portable and easy to set up* on page 14.

2 Floor

A sewn-in floor is useful for keeping sand out of your things. If it's detachable, you can use the shelter with or without, though attaching it may be fiddly. All floors, where supplied, are made from polyethylene.

3 Storage pockets

Pockets on the inside walls are useful for storing small items that can otherwise get lost in the sand.

4 Ease of use score

We evaluated how easy the beach shelters are to put up and take down, carry and use, and how stable they are. Each aspect is weighted equally.

5 Durability score

This score is based on the material's resistance to UV degradation. We measured the strength of the material initially and again after 672 hours of exposure to UV light (four weeks non-stop). Then we deducted the loss of strength (as a percentage) from the initial result. So a score

of 60 means it lost 40% strength, 35 indicates it lost 65% and so on.

Eight of the 11 shelters lost more than half their initial strength, making them more susceptible to tears. The poorer performers also showed excessive colour fading.

6 UPF

Because you mainly buy a sun shelter to protect you from harmful UV radiation, we ranked the models on their fabric's ultraviolet protection factor. For more on UPF ratings and other factors affecting a shelter's protective ability, see *UPF and UV radiation* below.

The measured UPF can vary between models with the same fabric due to slight variations in the weave, the stretching of the material or its colour. In our test this happened to the **SHELTA** models, so we've given the range of UPF that was measured for their fabric. For the other models we've given the UPF we found.

Not in the test

Two beach sun shelters from the **Australian Cancer Society** came onto the market too late for inclusion in our test.

Repairs

Once the frame of a pop-up type shelter is damaged, you'll have to get a new shelter. The flexible fibreglass poles for external frame shelters are the same as those used for igloo tents. If one breaks, you could try to get a new one from a camping shop, but you may have to cut it to length.

If the stitching comes undone (as it did on one of the sand pockets on the **SMART SHADE SS800** during our tests) you could try to fix it yourself or take it to a canvas or tent repair place.

UPF and UV radiation

The ultraviolet protection factor (UPF) is a measure based on the amount of ultraviolet radiation that a material blocks off, indicating the material's protective capacity. So the less UV that gets through, the higher the UPF.

The figures below give a rough indication of the level of protection a UPF range provides. They're from the Australian standard for clothing fabrics. With a beach sun shelter, however, many other factors are likely to reduce the level of protection: the time of day and year; the amount of cloud cover; the level of reflected UV radiation and the amount entering from the front and sides (if they're open or have windows); and, of course, your skin type and not using any or not enough sun block.

In contrast, though, sitting under trees gives you an equivalent UPF of only about 5 or less.

UPF range	UV radiation transmitted (%)	Level of protection
15–24	4.2–6.7	Good
25–39	2.6–4.1	Very good
40–50, 50+	<2.5	Excellent

*Pale, unhealthy lentil
chewers or healthy,
long-lived gourmets? The
vegie image is changing,
but what are the facts
behind the hype — do
you really have to give up
meat to be healthy?*



Going vegetarian

IN BRIEF

■ **A vegetarian diet** reduces the risk of some diseases, but you can get similar health benefits from a plant-focused diet that includes some meat.

■ **Vegetarians:** Include some legumes (for example, chickpeas and lentils), nuts or seeds and some grains (for example, rice and couscous) every day. Take care to get enough iron, zinc, calcium and vitamin B₁₂.

■ **Omnivores:** Focus on plant foods in your meals and consider skipping meat entirely on some days. When you have meat, eat small serves and choose lean cuts. Healthy eating, not meat eating, is the key.

OUR PARENTS DID INDEED KNOW best — eating your vegies is good for you. Studies show a plant-based diet rich in brightly coloured fruits and vegetables as well as unsaturated oils may not only reduce your risk of heart disease and stroke, but also reduce the risk of certain cancers and even prolong life. So vegetarians must come out on top, right?

Not entirely — while vegetarians generally reap all these benefits, studies also show that people who eat meat only rarely can achieve similar benefits. It seems it's healthy eating, rather than not eating meat at all, that does the trick.

What's in your greens (and reds and yellows)?

Something in the fruit and vegies must be the reason — and there are many candidates:

■ **No cholesterol and less saturated fat** — the main fat found in vegetables is unsaturated and the vast majority of vegetable foods contain virtually no fat. It's possible, however, to end up with a high-fat vegetarian diet; see *Just because it's vego...*, page 21.

■ **Lots of fibre** — both insoluble fibre, thought to help prevent some cancers, and soluble fibre, which can help to lower blood cholesterol as well as help prevent some cancers.

■ **Antioxidants** — vitamins A, C, E and folic acid are among the thousands of antioxidants (most of which are not vitamins) found in fruit and vegetables. Carotenes, including beta-carotene, also fall into this

group as they can be made into vitamin A in the body. Antioxidants are found in many other plant foods too — legumes, nuts, olive oil, red wine and tea. It's believed they help protect against cholesterol harming your arteries by stopping it 'oxidising' — oxidised cholesterol is what's thought to do the damage.

■ **Other protective phytochemicals** — 'phyto' means plant, and these chemicals are thought to protect against some diseases: examples include indoles, isocyanates, flavonoids, phenols, limonene, coumarins, isothiocyanates, monoterpenes, phytosterols, phyto-oestrogens and thousands of others.

■ **Folic acid** — not only an antioxidant, folic acid also reduces the level of homocysteine, a substance formed in the body and linked with heart disease.

Vege burgers put to the test

Our two sister organisations in the US and UK have put veggieburger patties sold in supermarkets and health food stores to the test. Both found the burgers measured up well nutritionally, especially compared to a beefburger patty. Most were relatively low in fat and some were also good sources of fibre (depending on their ingredients).

The only hitch was that the UK test found them all to be relatively low in iron, with less iron than a serve of green lentils.

But if you're at a loss as to what to serve your vegetarian teenager, you could do worse than a veggieburger patty in a roll with salad and tomato sauce.

■ **Less iron** — too much of the type found in animal foods (haem iron) can increase the risk of heart disease in some people. However, too little dietary iron can also be a problem, particularly for premenopausal women, who need more iron than men and need to take particular care with their iron intake (see *Getting enough iron*, below).

Meat matters

Of course, there are many other reasons people choose to go vegetarian, such as you'd rather eat an ex-bean than an ex-animal, or because of particular environmental concerns (see *Why go vego?*, right). For many, a healthier diet may be icing on the cake rather than the main focus. But when you do cut the meat from your diet, what are the potential pitfalls?

Extremely restrictive diets can be hazardous, but a vegetarian diet containing milk and eggs can provide everything needed for health. So, too, can a vegan diet (see *Different vegetarians*, page 21), though you need to make more careful choices, and some groups of people may need a dietary supplement. Here are the main worries with going veg:

■ **Getting enough iron** . Although too much iron may not be good, for women (who lose iron every time they menstruate or who are pregnant or lactating) getting enough is a more likely problem. The difficulty is eating enough vegetables, fruit and grains to get the amounts of iron needed — sources include legumes, tofu, green leafy vegies, nuts and seeds, whole grains, dried fruit and fortified breads and breakfast cereals.

Iron deficiency can make you tired, but just because you're tired doesn't mean you're iron-deficient. Women often work a second shift at home and may suffer from lack of sleep as well as a heavy workload, which all the iron in the world can't fix. Meat is a good source of iron, but with some care it's possible to get enough from non-meat sources. For more information about checking your iron intake,



Why go vego?

Many vegetarians say it's because of how good the food can taste and look, but there are plenty of other reasons:

- **Health:** The most common reason given for going vegetarian (see page 18).
- **Animal welfare:** Many people object to modern farming practices; others simply love animals and don't want them killed for their benefit.
- **Religious beliefs:** Many religions dictate vegetarianism; for example, Seventh Day Adventists follow a lacto-ovo vegetarian diet and many Buddhists are vegan.
- **Environmental concerns:** Many advocates consider it might help solve the world's environmental and starvation problems. However, the issues involved are very complex. For example: the impact of the greenhouse gas methane produced by cows versus the pesticides used on crops; feeding grain to people rather than animals may have a positive effect on world food supplies, but in Australia cattle and sheep are often grazed on land unsuitable for growing grain (but this can cause this land to degrade ...); and so the arguments continue.

A VEGETARIAN FOR MANY REASONS

Bernadette from Sydney became vegetarian when she was just 15, after a school excursion to a cattle sales yard brought home to her the realities of meat production.

"I'd been thinking about going vegetarian for a while, but when I saw the conditions the animals were kept in and the way they were treated I stopped eating meat that night and never went back," she says.

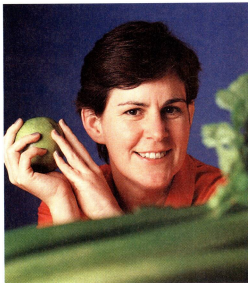
Bernadette is a lacto-ovo vegetarian, though she has occasionally eaten fish when she's been travelling and there's no other option. "Sometimes it's hard — if people invite me to dinner and I tell them I'm vegetarian, you can see that they're worried about what they can give me. But what I love about being vegetarian is the food — I think it makes you a bit more adventurous. You seek out new recipes and look for new ways of doing things."

As well as animal welfare concerns, Bernadette says she thinks it's had health benefits for her. "I'm much more likely to think about what I'm eating and I read labels carefully. I can't just grab a takeaway as so many contain meat somewhere along the line."

Bernadette also feels fortunate that her parents supported her choice and even made sure she had real vegetarian meals rather than meat and three veg without the meat. "Dad was the cook in our family and came up with some great meals for me," she says.

She always chooses free-range eggs and though she eats dairy foods, she mainly uses soy milk. She also checks labels for things such as gelatine and animal fats. "It annoys me when I find something like animal fat in chocolate biscuits. You have to be really careful in restaurants, too — you say you're vegetarian and then you discover the vegetable soup you ordered is made with chicken stock — and that's assuming there was a vegetarian dish on the menu at all," she says.

But the benefits outweigh any difficulties. "I can look animals in the eye and when I hear of some farm animals being mistreated I know I'm doing my bit to help." Bernadette adds, "I'm not evangelical about it; I keep it to myself mostly — when people find out I'm vegetarian they seem to need to defend their meat eating or talk endlessly about their favourite butcher."



Vege goodness in a pill?

If eating plenty of vegetables can do the good-health trick, can you get the good bits in veges from a pill? Antioxidant pills can provide only a small selection of the goodies found in fruit and vegetables, so there's no substitute for eating plenty of brightly coloured fruit and veg — only then can you be sure to be getting all the protective compounds on offer (see page 18).

For more on antioxidant supplements, see *Antioxidants — health in a pill?*, CHOICE, June 1999.

see *Are you getting enough iron?*, CHOICE, April 1997.

■ **Getting enough vitamin B₁₂.** Animal foods provide all the B₁₂ you need — so if you have dairy foods or eggs you're OK. Vegans can get B₁₂ from soy milk and cereals that have it added, and studies are under way to check if the type of B₁₂ found in mushrooms is used by the body. Comfrey and spirulina, once thought to be sources of B₁₂, have been found to contain a form the body can't use. There are also questions regarding the body's ability to use the B₁₂ found in fermented soya products such as tempeh.

It's hard to spot a B₁₂ deficiency until after damage has occurred — once you can notice the damage to blood cells and nerves, it's too late — so it's a good idea to have your blood B₁₂ levels checked regularly if you're a vegan, and pregnant or breastfeeding vegans may need a supplement. Children may too, once breastfeeding stops, unless they are having a formula or soy drink that has added B₁₂.

■ **Getting enough calcium.** If you include dairy products in your diet, calcium isn't going to be a problem. Vegans, however, can get their calcium



from fortified soy beverages as well as smaller amounts from foods such as broccoli, green leafy vegetables, almonds and other nuts, some dried fruits (especially figs), oranges, tahini (sesame seed paste) and tofu. For more on checking your calcium intake see *Boning up on calcium?*, CHOICE, August 1997.

■ **Getting enough zinc.** There's plenty of zinc in animal foods, but you need to choose carefully to get enough from plants — nuts and seeds are good sources. Zinc is also found in legumes, soy prod-

Is it safe for the kiddies?

A vegetarian diet can provide all the nutrients a growing infant needs, provided you make especially sure their diet is varied. Unless you're well-versed in nutrition, it's worthwhile getting the advice of a dietitian if you're bringing your baby up as a vegetarian.

All the possible problems with vegetarian diets (see *Meat matters*, page 19) count for kids especially — it's particularly important to watch iron, calcium and protein.



The other problem kids in particular face with a vegetarian diet is getting enough calories — growing takes lots and the sheer bulk of a vegetarian diet can make eating sufficient amounts difficult for small kids. Fat-containing foods are the best sources of calories — until children are about five years old, their diet should be higher in fat than an adult's. If you eat dairy, opt for full-cream dairy products rather than low-fat versions for children under five. Vegan diets are trickier, so you may need expert advice; ask your GP to refer you to a dietitian.

Teen trouble

It's particularly common for teenage girls to become vegetarian. One Australian study shows up to 37% of teenage girls call themselves vegetarian, compared to up to 12% of boys. Health, animal welfare and environmental concerns are the usual reasons. However, while they face the same nutrition problems as other vegetarians, they also need enough energy and nutrients for rapid growth.

Many teenage girls decide to become vegetarian to keep their weight down and in a few it may be a disguise for an eating disorder — a lettuce-based salad, crispbreads and fruit don't contain many calories. It's important that, if teenagers (and anyone else for that matter) don't eat meat, they include vegetarian alternatives such as legumes, nuts, grains and seeds every day — not just occasionally; these foods contain important nutrients.

While healthy, lettuce leaves aren't enough to live on and grow — make sure a teenager's vegetarian diet contains foods like legumes and cereal as well as vegies.

ucts, whole grains, wheat germ and green vegetables. Yeast in bread helps to make the zinc in flour more easily absorbed. Calcium can reduce the amount of zinc you absorb, so if you're worried about your zinc intake, drink milk between rather than with your meals.

All that said, just because you do eat meat doesn't mean you don't have to worry about getting everything you need from your diet — it's healthy eating, not meat eating, that's the key.

Perfect protein

Most of us eat more protein than we need and there's little risk of protein deficiency in a vegetarian diet as long as you're getting enough kilojoules of energy overall.

Protein is made up of amino acids, and there are eight amino acids the body needs to get from food, as it can't make them. These eight essential amino acids are found in animal foods (including dairy products and eggs). While plant foods contain some of each of them, they don't contain them all in the right proportions, so you need to combine different plant foods — for example, beans on toast (legumes and cereal) and muesli (nuts and cereal) contain all eight essential amino acids.

You don't need all eight amino acids at each meal. As long as your vegetarian diet is generally balanced and contains a wide variety of foods, your body has a pool of amino acids it can draw from if a particular meal is missing one or two. You needn't worry about it — unless you eat only fruit and vegetables and no other vegetarian foods.

Just because it's vego ...

... doesn't mean it's healthy. Let's see — Mexican (beans) with plenty of sour cream, cheese and guacamole; Italian, let's take the fettuccini with cream mushroom sauce, garlic bread and an eggplant parmigiana, deep-fried with plenty of cheese; Indian, some deep-fried mixed-veg entree and creamy malai kofta for a main — it's all vegetarian, but low-fat it isn't. There are also plenty of junk foods that could wear the vegetarian label — chips, chocolate, cakes and biscuits, for example.

Most vegetables are low in fat and all have no cholesterol, but by the time you finish giving them the full-fat treatment, they can be a dietitian's nightmare. Full-fat cheese, cream, sour cream and butter can all add plenty of saturated fat. And vegetable oils, avocados, nuts and seeds all contribute plenty of calories even though the fat they contain is mainly unsaturated. If you're watching the fat and calories in your diet you need to watch how much of these foods you eat. And if you use dairy products, low-fat versions are better choices. □

Vegetarian alternatives

- **Soy beverage** is a drink made from soybeans — use it like milk.
- **Tofu** is soy 'milk' curd. You can use it in stir fries or patties, or as a substitute for cream in cakes and ice cream.
- **Tempeh** is made from whole fermented soybeans. Serve it grilled or in stir fries, for example.
- **TVP (textured vegetable protein)**, made from defatted soybean flour, is sold in meat-like shapes. Use it as mince or in casseroles.
- **Gluten** is made from wheat protein. It can be used in patties, casseroles or stir fries, for example.

There's now a variety of vegetarian sausages, bacon, luncheon meats, etc. available. Some people find them (and things like TVP and gluten) a useful addition to their vegetarian diet, while others prefer to avoid 'meat substitutes', sticking to legumes, nuts, grains and seeds.



Different vegetarians

Vegetarians come in many flavours. People can use the term to mean anything from those who say they're vegetarian but regularly eat fish or seafood, to others who avoid even jelly or lollies as they often contain gelatine, an animal by-product.

Here's a basic breakdown of the common kinds of vegetarian:

- **Lacto-ovo:** No meat or fish, but includes dairy food and eggs (often free-range); the type of vegetarianism mainly discussed in this article.
- **Lacto vegetarian:** Dairy food, but no eggs.
- **Vegan:** No animal by-products, including dairy food, eggs, gelatine, animal rennet and honey. Such a diet can contain all the necessary nutrients, but you need to choose foods more carefully.
- **Macrobiotic:** The eventual aim for the purists is to reach a stage where only brown rice is eaten. However, as the basic macrobiotic diet is based on organically grown vegetables and grains, it can provide a balanced diet when not taken to extremes.
- **Fruitarian:** Includes only fruit and isn't balanced.

Hidden horrors

Many vegetarians, not just those who are vegan, prefer to avoid all products that come from killing animals, not just meat. This means watching out for all sorts of ingredients that creep into foods, such as:

- Gelatine is an animal product, found in some ice cream, desserts, jellies, lollies and even yoghurts.
- Animal fat is often used in cakes, biscuits and pastries.
- Meat extracts and stocks can be used in some soups or vegetable dishes.

Annual buying guide

This handy guide to the year's best test performers should help you make the most of your money when buying presents or deciding what to buy in the summer sales.

And don't forget to look at some of the products in this issue too — see champagnes and sparkling wines (page 7), Christmas crackers (page 12), solar water heaters (page 29) and beach sun shelters (page 14).

IN BRIEF

- For more information about the tests, product features and what to look for when buying, refer to the original article.
- If you're a new subscriber and don't have a particular issue from which you want more details, you can get a limited number of back issues free of charge. Phone CHOICE Consumer Services on (02) 9577 3399 and have your subscriber number handy.
- Changes in technology mean there's a fast turnover of many products, so you may find new models on the shelves that we haven't tested. If a model tested is still available, our recommendation means we think you'll still be satisfied with its performance, though it mightn't have the very latest features or technology.
- Prices given are a good target to aim for when shopping around. Some are recommended retail prices, others are based on nationwide price checks made between August and November 1999.

Gardens and DIY

Tap timers

(November 1999)

An automatic tap timer could be just the ticket to look after your garden in your absence — or even while you put your feet up and watch. Depending on what kind you get, it can do anything from turning the tap off after a certain amount of time, to watering every second day — unless it's rained.

There are several kinds of tap timer available:

■ Manual timers, which turn the tap off after a set interval — you still have to turn it on.

■ Battery-operated, fixed-program timers that allow you to set the watering time and duration for every day — ideal if you're going away.

■ Battery-operated, variable-program timers, which provide even more flexibility than the fixed-program timers. They're a bit harder to set up, but you can also get moisture sensors to go with some of them so they don't water after rain.

See the original article for more on which type would suit you best.

WHAT TO BUY

Manual timer

GARDENA Water Timer G1182/4 \$50

Battery-operated fixed-program timer

HOZELOCK Aqua Control 1 2705 \$123

Battery-operated variable-program

GARDENA Water Computer 1030 (G1234) \$133



GARDENA Water Timer G1182/4

Petrol lawnmowers

(November 1999)

All the lawnmowers tested did a good job and, with the exception of one, which was heavy and awkward to manoeuvre, you'd probably be happy to own any of them.

WHAT TO BUY

ROVER 2-stroke XL 3122	\$499
SUPASWIFT Lawn Leader 7670JA (four-stroke)	\$549



Chipper-shredders

(September 1999)

Chipper-shredders turn your waste garden clippings into mulch that you can spread on your garden to provide nutrients and help prevent water loss; or they can be tossed on the compost heap for fertiliser.

We tested models suitable for processing smaller garden waste (no more than 45 mm in diameter), and all performed at least satisfactorily, though two couldn't be recommended for safety reasons. While some jams are inevitable when using a chipper-shredder, all the models in the *What to buy* list are easy to unlog.

WHAT TO BUY

ROVER Maxi Muncher 9664	\$690
VIKING GE120	\$645
VICTA Mulchmaker 1800 AH211	\$469
AL-KO Dynamic H22005	\$693

Ryobi CC182VR

Cordless drills

(August 1999)

A cordless drill can be more convenient than mains-powered models, particularly if a power point isn't easily accessible — outside or up a ladder, for instance. However, if you're unlikely to use it often, you'll probably have to charge the battery before you can use it. The models tested ranged from one to five hours to recharge.

The RYOBI CC182VR in the *What to buy* list scored best overall (by a long way) for performance, but was let down by its ease of use; the AEG BS2E 12 T BPB scored well for ease of use but was a bit weaker on performance. The BOSCH PSR 14.4 VES-2 is a good compromise between performance and ease of use and could be the ideal choice for the occasional home handyperson.

WHAT TO BUY

RYOBI CC182VR	\$169
BOSCH PSR 14.4 VES-2	\$199
AEG BS2E 12 T BPB	\$239



The car



Car wax and polish

(January/February 1999)

If you're planning to hit the coast this summer, polishing your car can help protect the paintwork against salty air, as well as other harmful substances like air pollution, road dirt, tree sap and bird droppings.

We tested 27 waxes, glazes and polishes to see how well they shine the duco, whether they scratch the surface, how long the shine lasts, and how easy they are to apply and remove.

WHAT TO BUY

AUTOSOL 2 in 1 Polish & wax (cost per polish — small car: \$4.50)	\$8.95
MOTHERS CALIFORNIA GOLD Carnauba cleaner (hard wax) (cost per polish: \$2.60)	\$32.95

Aunger Prolock APL 1020



Car steering wheel locks

(May 1999)

Is your car steering wheel or handbrake lock good enough to defeat a thief? Only five out of the 16 locks tested passed all our breaking and lock-picking tests. While a further three offered some resistance, eight yielded with alarming ease — one of our testers broke one with his bare hands, and he doesn't even work out!

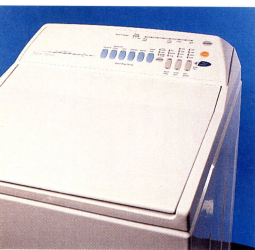
WHAT TO BUY

SPELRLING Prolock (A)	\$40
SPELRLING Prolock bodyguard (B)	\$40
AUTOLOK 2000	\$199
THE CLUB 1000A Original Club	\$40

(A) Was called AUNGER Prolock APL 1020.

(B) Was called AUNGER Prolock Bodyguard APL 3030.

Round the house



Washing machines

(March 1999 and July 1999)

For the past year we've been testing washing machines continually and bringing you regular updates of results and availability.

While top and front loaders are comparable for dirt removal, front loaders generally score better for energy and water efficiency, and gentleness. And while they're more expensive to buy, they're generally cheaper to run over time. On the other hand, top loaders typically have a larger capacity and a shorter wash cycle time, which may be more convenient if you do a lot of washing.

There was very little difference between the front loaders tested in March this year: only 3% separated the top and bottom of the table. The Best Buys below are cheap to buy and run for both front loaders and top loaders.

BEST BUYS

■ Top loaders

FISHER & PAYKEL Excellence GW509	\$859
HOOVER BOSS 800EL/800RL	\$1049/\$999

■ Front loaders

WHIRLPOOL AWM 285	\$1099
ARISTON AB 936	\$1095
BOSCH WFB 1605 AU	\$1249

Daikin FTY/RV60GV1A



Water-efficient shower heads

(December 1998)

Remember when a 'water-saving shower' meant standing in what seemed like a light mist rather than running water? We had 15 trialists try each of 20 water-saving shower heads (boy, were they clean by the end of the week!) to see how effectively the showers wet them all over, rinsed away soap and shampoo, and how comfortable they were.

The great news is you can save water, save money and have a decent shower with most of the water-efficient shower heads tested: those recommended in the *What to buy* list were the pick of the bunch. Imagine how much you'd save showering under one of these with a friend!

WHAT TO BUY

TELEDYNE Water Pik SM 64E	\$75
CON-SERV OH 002B	\$65
SHOWERKING — The Pulsator	\$35
FLEXISPRAY Conserva Calypso	
Massage 31-0753	\$43
BRASSHARDS SR331C	\$10
FLEXISPRAY Conserva Calypso	
Hi Rise 31-0593	\$32
GROHE Relexa 28 200	\$175

Air conditioners

(October 1999)

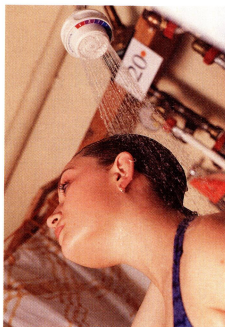
Reverse-cycle air conditioners not only cool your house in summer, but warm it in winter — and use less energy than other electric heaters.

The test included seven split-system models (which means the air outlet is inside the house, and the noisy compressor is outside) with enough power to cool an average-sized open-plan living room. Both the models in the *What to buy* list have good cooling and heating efficiency, good airflow and are easy to use.

WHAT TO BUY

DAIKIN FTY/RV60GV1A	\$2480
CARRIER 53NG250H*	\$2350

* According to Carrier, this model was to be superseded by October this year, so it may be hard to find.



Leisure

Compact cameras

(December 1998)

Compact cameras offer worry-free, point-and-shoot photography, produce reasonable to good picture quality and are quite easy to use.

While they don't give the same quality and versatility of photography as single-lens reflex (SLR) cameras, they're usually cheaper and there's less equipment to carry around.

This test included standard 35 mm and the relatively new Advanced Photo System (APS) compact cameras. The APS cameras produced photographs of a similar quality to 35 mm, and are more versatile. The trade-off is ease of processing: it may not be as readily available as for standard film formats.



Rollei Prego 115 Slimline

WHAT TO BUY

■ 35 mm, zoom, autofocus	
ROLLEI Prego 115 Slimline	\$427
OLYMPUS mju Zoom 140	\$549
■ APS, zoom, autofocus	
FUJIFILM Fotonex 3500ix MRC	\$700
MINOLTA Vectis 40	\$759

Note: Camera features and technology change quickly, and as this test was done over a year ago, you may find that some newer models offer better features and performance than those in this test.

Vacuum cleaners

(September 1999)

The test involved 13 vacuum cleaners costing from around \$500 to \$3500 — a lot of money to pay for a vac! We compared them with two much cheaper models (around \$200) that did well in a previous test, to see if it's worth spending so much money. The vacuum cleaners in the *What to buy* list outperformed the cheaper ones as well as those costing well over \$1000, but previous tests indicate you could safely spend considerably less than \$500 and get a satisfactory vacuum cleaner.

WHAT TO BUY

WERTHEIM W4030 (barrel)	\$849
HOOVER U6331-906 (upright)	\$599



Wertheim W4030

Irons

(January/February 1999)
We enlisted a group of 13 people who use irons regularly to put 11 steam irons through their paces and assess each one for performance and ease of use. They discovered that you don't need to spend big bucks for an iron that's easy to use and irons well: our Best Buy costs only \$20.



Tiffany SI 811

WHAT TO BUY

SUNBEAM ProSteam SR1100	\$40
TIFFANY SI 811	\$20
BREVILLE Super Surge SS-700	\$48
MOULINEX Chronomate 35 Vario Plus	\$35

BEST BUY

Single-use cameras

(December 1998)

Single-use cameras can be useful if you don't have your camera with you; where there's a risk it will be lost, stolen or damaged; when you want to take underwater pictures; or even for special social events: leave them lying around on the table for guests to take candid pictures of each other.

However, they have their limitations: they're fixed-focus, so they're not good for close-ups and the aperture lets in relatively little light. There were also problems with some of the viewfinders: the negatives captured more than you could see when taking the photo.

WHAT TO BUY

■ Standard, without flash	
AGFA Le Box Go!	\$10-\$12
KODAK Max Outdoor (A)	\$12
■ Standard, with flash	
AGFA Le Box Go! Flash	\$20
■ APS, with flash	
KODAK Fun Advantix Flash	\$25
■ Panoramic	
FUJIFILM Quicksnap Panorama	\$22
■ Waterproof	
KONICA Film-In Waterproof	\$21
AGFA Le Box Ocean	\$20
■ Telephoto	
FUJIFILM Quicksnap Super 800 Tele 100	\$23

(A) Was called Kodak Fun Gold — the changes are cosmetic only.

Travel packs

(October 1999)

A travel pack is a cross between a suitcase and a backpack and a good compromise for both. They have a detachable daypack that can be worn on the back of the main pack or on your front. We tested twelve 70–75 litre packs for puncture, tear and water resistance, comfort and ease of use, and the seven in the *What to buy* list passed all the tests.

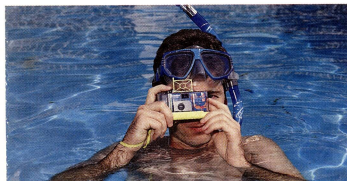
It's important that your travel pack is comfortable, and you may need to spend a bit of time in the shop finding the right pack for you. And if you're planning to buy one as a present for someone else, take them for a fitting first: one shop refused to sell our buyer one 'for her son' without a fitting.



WHAT TO BUY

BLACK WOLF Grand Teton 75	BEST BUY	\$279
NOMAD Discovery 75		\$329
SUMMIT Adventurer Pack		\$369
ADVENTURE DESIGNS Tom Thumb 2		\$349
BERGHAUS Shadow		\$279
KATHMANDU De Luxe		\$400
SNOUGUM Indian Pacific		\$349

equal



Kitchen

Toasters

(March 1999)

Is it fair to compare a \$333 toaster with 19 that cost less than \$80: surely it would trounce the opposition? Well, we did it anyway — and it came last! That's bad news for people who've forked out a fortune, but good news for everyone else. In fact, the top-rating toaster, which cost \$39, was also one of the cheapest.

We also wanted to find out whether paying more for a stylish toaster gets you better toast. Within brands, the answer was generally yes. However, 'stylish' tends to mean 'chrome', and there were some inherent safety problems — many failed the surface-temperature safety test.

WHAT TO BUY

KAMBROOK KT91	BEST BUY	\$39
SUNBEAM TA200A		\$85



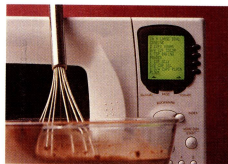
Kambrook KT91

Fridges

(August 1999)

A good fridge should be roomy enough for your needs, easy to clean, quiet, efficient, offer versatile shelving arrangements and, above all, keep your food at the right temperature without you having to constantly fiddle with the controls.

In this test of fridges from around 340–380 L, we found most models won't give you that luxury. However, the FISHER & PAYKEL electronic models are better than the rest in this respect, while the WHIRLPOOL scored well for other aspects of performance.



Microwaves

(May 1999)

They're quick, convenient, encourage healthy cooking and are energy-efficient. They can also be quite cheap to buy.

And if this isn't enough, microwave oven manufacturers are designing them to be even more useful. New features on models tested include:

- Display screens to show not only cooking times and weights, but also prompts or information.
- Onscreen recipes and cooking tips.
- A voice prompt, which could be useful for people with eye problems. You can also record messages for later replay.

WHAT TO BUY

SHARP R-390B	\$449
PANASONIC NN-S578WA	\$369
SANYO EM-X471 (A)	BEST BUY \$279

(A) The model number when we tested it was EM-X470 — it's had cosmetic changes (it's now available in five colours) that won't affect its performance or ease of use.



Fisher & Paykel Active Smart E381T

WHAT TO BUY

FISHER & PAYKEL Active Smart E381T	\$1215
FISHER & PAYKEL Active Smart E372B	\$1215
WHIRLPOOL WRN42RWG6	\$999

Sandwich and jaffle makers

(May 1999)

This test of electric snack makers earlier this year found that sandwich makers had problems sealing regular-size pieces of bread. The best way to avoid being burnt by the hot contents of the sandwich leaking available is to use super-size bread, readily available in supermarkets.

The jaffle makers tested (which are like sandwich makers, only they don't cut the snack in half) had no problems sealing all sides of regular-size bread.

The Best Buy, the BLACK & DECKER Jumbo Jaffle SM2CH, is still available. However, there wasn't a great deal of difference between the snack makers overall, and you'd probably be happy with any of them, especially if bought on special.



Sandwich makers, from left: Sunbeam Easy Clean GR6200WA; Moulinex Sandwich Express BK1; Philips Sunrise HD 2400; Sunbeam Mmooo GR6110WA



Jaffle makers, from left: Sunbeam Classic Snack GR031A; Sunbeam Thick Snack GR023B; Black & Decker Jumbo Jaffle SM2CH

WHAT TO BUY

■ Sandwich makers	
SUNBEAM Easy Clean GR6200WA	\$45
MOULINEX Sandwich Express BK1	BEST BUY \$53
PHILIPS Sunrise HD 2400	\$45
SUNBEAM Mmooo GR6110WA	\$50

■ Jaffle makers	
BLACK & DECKER Jumbo Jaffle SM2CH	BEST BUY \$40
SUNBEAM Classic Snack GR031A	\$60
SUNBEAM Thick Snack GR023B	\$55



Breadmakers

(June 1999)

Breadmakers are a lot more versatile than their name suggests: with many you can also make fresh pasta dough, jam, soup and butter.

Most of the breadmakers tested are capable of making good bread, but you may have to experiment a little with the recipes to get a loaf you're happy with. However, of those still available, only the SUN-BEAM scored well for distributing raisins: most machines left them in a big clump at the bottom of the loaf. While raising

bread may not be top of your bread-making priority list, the same applies to olives, sun-dried tomatoes, nuts or whatever else you want to throw in.

WHAT TO BUY

SUNBEAM Convection Bakehouse BM005	\$290
BREVILLE Baker's Oven Plus BB250	\$169
PALSONIC Autabakery PAB-3600	\$199
PANASONIC Bread Bakery SD-206	\$299
PANASONIC Bread Bakery SD-250	\$269
TIFFANY Automatic Bread Maker BM-642	\$119

Dishwashers

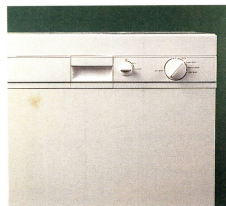
(June 1999)

If you bought a dishwasher on the basis of its star rating for energy efficiency, you might be in for a shock. Manufacturers can choose any washing program (light, normal, etc) that meets the cleaning requirements for efficiency testing — so a model with five stars for its 'light' program may be an energy-munching monster on its normal program.

The good news is that you can have a good wash and good water and energy efficiency: almost all the models in the test that scored well for efficiency also got good washing scores.

WHAT TO BUY

ASKO 1605	\$1299
ASKO 1705	\$1499
CHEF Classic 8913	\$749
DISHLEX Global DX300	\$1089
BLANCO BDW 203	\$1099



Chef Classic 8913



Multi-function standalone electric ovens

(January/February 1999)

A multi-function oven provides great versatility in cooking, but don't let a huge array of functions influence your decision — their usefulness depends on what you cook, how much of a perfectionist you are and, of course, how well they perform.

All the ovens tested cooked well or reasonably well — the main difference between those in the *What to buy* list and the rest was better grilling ability.

WHAT TO BUY

SIMPSON Evolution 912 63C912W	\$1189
WESTINGHOUSE Freestyle POH668W	\$1209
CHEF Classic EWOCLEMF MW	\$929

Getting personal

Pantyhose

(July 1999)

Do you have to pay a fortune for pantyhose that are sheer, smooth and silky, fit well and last more than a few wearings? Our trialists went through more than 140 pairs to find out.

It's no surprise that pantyhose aren't designed to last long — none of the brands tested lasted five days for all trialists. A more unexpected problem was fit: our trialists had problems with the fit of either the body or leg length or the waistband in 40% of pantyhose.



WHAT TO BUY

SCHIAPARELLI Cristella, matte sheer	\$12.95
KAYSER Silken sheers, regular brief	\$6.95
REDE Redesetelle, sheer to waist bright pantyhose	\$17.95
ITALIA Sheer to waist	\$8.95

IT and communications

Mobile phones

(January/February 1999)

If you're looking to upgrade that cheap digital mobile phone you bought along with a call plan, the model still available from the original *What to buy* list scored well in all aspects of the last test, and also has reasonable stand-by and in-use battery capacity. But keep in mind that mobile phone technology is developing rapidly, and you'll probably find more recent models on the market with more advanced features and technology — we'll be reporting on some in an upcoming issue.

The price shown is full price, and you'll probably pay less if you buy the phone as part of a call plan.

WHAT TO BUY

MOTOROLA StarTac X \$899

Motorola StarTac X



Brother Fax-510

Fax machines

(July 1999)

With plain-paper fax machines getting cheaper and cheaper, you may think they're the way to go. But thermal paper machines still have a number of advantages for the home or home-office user: they're generally cheaper to buy and run, and don't require print ribbons or ink cartridges. They're also fast, and the quality of the text or image is just as good — if not better — than plain-paper ones. Their main disadvantage is that the pages can't be archived: the paper turns yellowish and the printed image fades.

WHAT TO BUY

BROTHER Fax-525MC [Thermal paper] (A) \$429

BROTHER Fax-515 [Thermal paper] (B) **BEST BUY** \$319

BROTHER Fax-920 [Plain paper] \$419

(A) This model has replaced the model tested (520MC) and has been upgraded to handle a 50 m paper roll; it has improved caller ID software and some cosmetic changes. However, these changes don't affect its overall score.

(B) This model has replaced the model we tested (510) with the same upgrades as above (see note A). These changes don't affect its overall score.

Entertainment

Portable (34 cm) TVs

(April 1999)

These are often bought as a second set, and are small enough to be carried from one room to another. But the trade-off for portability is sound: you're not going to get hi-fi-quality sound from these TVs.

We compared 11 for picture quality, sound quality, ease of use and portability. The viewing panel gave good marks for picture quality to all but two models, but most were let down by poor sound quality or irritating features, such as being difficult to tune or having to press a sequence of buttons to call up double-digit channel numbers.



Sharp CX-34G3

WHAT TO BUY

SHARP CX-34G3 \$379

LG CA-14F80 \$349

PANASONIC TC-14S15A \$409

Mini stereo systems

(December 1998)

Mini stereos may be great for background music or as a second stereo for your bedroom or your kids, but they're not for critical listeners or booming out music in large areas. Their main limiting factor is the speakers: they can't reproduce the full range of frequencies, and may distort sound at high volumes.

Speaker performance differentiated the best from the rest in this test, and the KENWOOD XD-352 was a clear leader in this respect. However, if you use a cassette recorder a lot you may be unhappy with the quality of the copied tapes and some sound distortion.

WHAT TO BUY

KENWOOD XD-352* \$439

* The model number when we tested it was XD-301 — it has had cosmetic changes that won't affect performance.



Kenwood XD-301

Want to save money on heating your water and help reduce the greenhouse effect by producing less CO₂? Think about a solar or heat-pump water heater.

PHOTO: GEOFF AMBLER



Hot water from sun and air

YOUR WATER HEATER CAN ACCOUNT for a large part of your household energy consumption and the related emission of the greenhouse gas carbon dioxide (CO₂). Modern solar and heat-pump water heaters use mainly the sun and air to provide you with hot water, producing much less CO₂. And some of the 11 models in our test can also save you money in the long run.

The test (based on Australian and international standards) included all widely available frost-protected thermosiphon and pumped solar systems, as well as all widely available heat pumps. (Put off by the jargon? *Throwing some light on the technology*, page 30, explains how the different systems work.) The systems can be connected to a mains-pressure water supply, and the size tested (around 300 L) is suitable for an average four-person household.

Using a standard simulation method, we also calculated how much energy these water heaters can save compared to four conventional electric and gas systems. Then we worked out for nine cities how the energy savings translate into CO₂ and money savings (see *Which system's best for where you live?*, page 34).

Is it for you?

If you're lucky enough to qualify for a water heater rebate (see *Shining brightly*, page 31), payback times can be very reasonable.

However, in many other cases you won't get a fast payback time for installing one of these systems — the quickest we calculated in this test was five

and a half to six years, and that only in some towns (Brisbane, Darwin, Perth and Rockhampton) with some systems. In some places you'd never break even with some of the tested systems. This is because solar and heat-pump water heaters are considerably more expensive to buy than conventional systems.

So for many people the main motivation for buying a solar or heat-pump water heater would be to reduce their household's environmental impact.

In most locations, the tested systems can produce up to several tonnes less CO₂ per year than conventional electric water heaters (see the tables on pages 35 to 37 for details). However, compared to conventional gas systems, only the best solar performers can save substantial amounts of CO₂.

If you think about the systems as an investment, though, it makes them more attractive — particularly compared to conventional day-rate electric and standard gas systems. Say you buy a \$3000 solar or heat-pump water heater instead of a \$1000 conventional system (so you 'invest' an additional \$2000), which saves you \$200 a year in energy costs. While a payback time of, say, 10 years may not sound too exciting, you'd have to go a long way to find another investment that returns 10% interest — after tax.

Getting the right size

As a general rule, one person uses about 50 L of hot water each day. If you take very long showers, have a dishwasher or often wash clothes in warm or hot water, you may use more than that — not to mention if you have a spa bath you use frequently.

IN BRIEF

- A conventional electric water heater produces about the same greenhouse gas pollution as your family car.
- With a solar or heat-pump water heater your household can produce less CO₂ per year — by several tonnes — compared to a conventional electric system.
- In some places (and depending on the system you're replacing) the systems that performed well in our test can pay for themselves in a few years.
- If you live in Queensland, some areas of NSW or Whyalla in SA, you can get a government rebate when buying a solar or heat-pump water heater.

Thank you

Thanks to all of you who wrote to us about your experiences with solar and heat-pump water heaters. An overwhelming majority of you are very happy with the investment, many reporting trouble-free operation of your solar system for 15 years or more.

SOLAR WATER HEATERS

GST effects

Electricity and natural gas don't attract a sales tax, so prices for these fuels are likely to increase by 10% when GST is introduced in July 2000. This means payback times for solar and heat-pump water heaters will become more attractive then. On the other hand, the prices of solar and heat-pump water heaters will increase by about 4% after the introduction of GST. So if you're thinking of buying one, do so before July 2000.

Solar water heaters basically consist of a water-storage tank and collector panels that absorb the sun's radiation and transfer it to the water or a heat-exchange fluid. The diagram (below) shows a thermosiphon system, where both tank and panels are installed on your roof. Pumped solar systems have only the panels on the roof and the tank on the ground. See *Solar systems*, above right, for details.

Based on a consumption of 50 L, for solar heaters an average four-person household needs about four square metres of solar collector area (two panels) and a 300–360 L tank, to allow for days with lower radiation or higher demand (for example, if you have visitors). If your panels can't be installed in an ideal location (see *Installation*, below), their efficiency may drop and you'll need a larger collector area. An additional panel is available for all the tested models (Beasley: \$500, Edwards: \$550, Solahart: \$600).

Heat pumps don't rely on the sun, so a slightly smaller system is sufficient (270–315 L tank for four people).

Installation

Installation costs vary considerably between systems. Generally, the air-source heat pumps are cheapest (around \$200–\$300), followed by thermosiphon systems (around \$400–\$600). Systems with one part on the ground and the other on the roof can cost up to \$700 to install.

All these prices can increase, depending on your situation — for example, your roof may require reinforcement before you can install a thermosiphon system weighing several hundred kilograms.

An air-source heat pump (see right for more about these) should be installed where it gets sufficient airflow — preferably outdoors. Solar panels should ideally face north and be mounted at an angle of 20° to 50°. Make sure they're not shaded during the day by other buildings or trees. Talk to your supplier about the best location.

With all hot-water systems you need to insulate the hot-water pipes to prevent heat losses. This is particularly important if there's a long distance between tank and taps (for example, with thermosiphon systems).

Throwing some light on the technology: how they work

Solar systems

Solar water heaters use the sun's rays to heat your water. They basically consist of solar collector panels and a storage tank.

The most common type has panels covered by a special toughened glass that sunlight can easily pass through. The solar radiation hits an absorber plate that has a number of vertical tubes (see the diagram, below left). The design and materials used for the absorber plate and tubes can vary; more sophisticated systems have a selective surface that absorbs a lot of radiation while only emitting very little heat radiation.

A fluid (cold water from the mains supply or an anti-freeze fluid; see below for details) enters the panels at the bottom and is heated by the sun. Due to the **thermosiphon** effect (the warmer the fluid, the lighter it is) the heated fluid rises naturally inside the tubes.

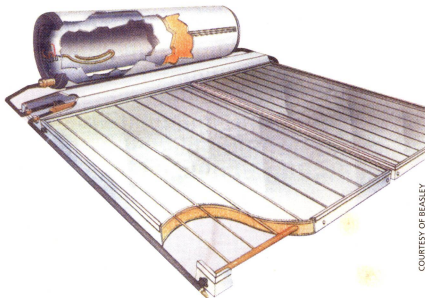
A solar water heater can't provide 100% of your hot-water needs year-round. Even in summer there may be several consecutive overcast days when the sun doesn't provide enough radiation to sufficiently heat your water. That's why all solar water systems have an electric or gas booster in their tanks, which kicks in when the sun drops out.

■ Thermosiphon systems

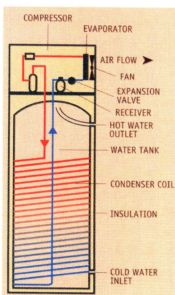
With a thermosiphon system, both the storage tank and the solar collector panels are mounted on the roof. As the complete system can weigh several hundred kilograms when filled with water, you need to make sure your roof can support such a weight, and reinforce it if necessary.

The tank is mounted horizontally above the collector panels. The thermosiphon effect is enough to circulate the fluid from the panel into the tank without an additional pump.

In areas that never get frost, water can be circulated through the panels and heated directly. However, in frost-prone areas, the water can freeze and destroy the panel. A heat-



Heat-pump water heaters work on the same principle as air conditioners: they transfer heat from one place to another — in this case from the air into the water-storage tank. See *Heat pumps*, right, for details on how they work and the different designs (the diagram, right, shows the Quantum Turbo Compact Eyre).



exchange fluid with a freezing point much lower than water is used. It flows in its own closed circuit: it's heated in the panels, transfers its heat energy to the water in the storage tank, cools down and returns to the panel to be heated again.

■ Pumped solar systems

You may not want to have the storage tank on the roof — for the look of it, or because your roof can't support the weight.

With a pumped solar system, only the collector panels are mounted on the roof, while the tank is at ground level. As the thermosiphon effect can't circulate the water from tank to collector in this case, the system needs an electric pump.

Pumped systems don't require a heat-exchange fluid for frost-protection: if the temperature in the collector panel is close to freezing point, a sensor switches on the pump, which then circulates warmer water through the panels.

■ Booster options

With pumped solar systems, the heated water from the solar collector enters the tank at the bottom or part way up the tank. For good solar performance it's therefore preferable to have the booster element higher up in the tank so it doesn't interfere with the water heated by the solar collector.

On the **SOLAHART 302SL**, this is standard. However, the **BEASLEY Centurion** and **EDWARDS Economiser** combine the solar collector with a tank you can also use as a conventional electric heater, so the element is right at the bottom.

Both tanks are also available in a twin-element version with an additional element further up the tank (Beasley: add \$90; Edwards: add \$72).

We calculated the solar systems' performance for two scenarios:
—When the version of the tank with a single bottom element is used (these are the results in the tables).

—When the upper element of the twin-element version of the tank is used.

Using the upper element considerably improved the **BEASLEY's** performance. You can save several hundred more kilograms of carbon dioxide in most locations, and the payback time can be several years shorter.

The **EDWARDS'** upper element is too high up in the tank and there's only a relatively small amount of water that can be heated by the element. The system wasn't always able to provide the amount of hot water in the morning required by our simulation. While the carbon dioxide and money savings were even greater than for the **BEASLEY**, we can't recommend this option unless you're prepared to run out of hot water on some mornings, or to reduce your hot-water consumption in the morning.

Heat pumps

A heat pump works on the same principle as a fridge or air conditioner. It doesn't create heat, but transfers it from one place to another:

■ A cold refrigerant collects heat from the surrounding air as it flows through an evaporator.

■ It then flows into a compressor that creates a high-pressure, high-temperature gas.

■ The gas transfers its heat to the water in the storage tank via a condenser, and liquefies again in the process.

Shining brightly — rebate schemes

If you live in Queensland, certain NSW council areas or Whyalla in South Australia, there's further motivation for buying an alternative water heater — financial rebates on their purchase price. Here's what's on offer:

■ The **Queensland** government rebates \$500 for new solar-boosted heat pumps and solar systems with at least 3.5 square metres of collector area. Solar systems with 1.75–3.49 square metres of collector area are subsidised by \$300. If you replace an existing solar system, you can get \$100 rebates for both the replacement tank and collector. Contact Energy Wise on 1300 369 388.

■ In **NSW**, the Sustainable Energy Development Authority (SEDA) offers a \$500 rebate for qualifying solar and heat-pump water heaters with at least a 200 L tank. However, the rebate is only available if you live in an **Energy Smart Council** area that has adopted SEDA's Energy Smart Home policy, setting minimum energy standards for new homes. The contact number is (02) 9291 5260. In addition, SEDA, in conjunction with AGL and Solahart, is currently offering 24 months' interest-free finance for gas-boosted solar water heaters. Contact Solahart in NSW on 1800 079 507.

■ The **Whyalla City Council** in South Australia has arranged the following rebates for solar and heat-pump water heaters: participating manufacturers discount their systems by a certain amount (say, a couple of hundred dollars). The city council then rebates to you 10% of the discounted purchase price. And to top it all off, a \$100 rebate on installation costs is available from the South Australian energy retailer, ETSA.

Unfortunately, these are the few bright stars in an otherwise very dark rebate sky. One of the main reasons solar and heat-pump water heaters often don't pay for themselves is their high purchase price compared to conventional systems. And that's partly because they're manufactured in relatively small numbers.

If rebate schemes can convince more people to choose these environmentally friendlier systems, higher sales figures should eventually lead to reduced prices.

CHOICE urges national, state and local governments to provide rebate schemes to make solar and heat-pump water heaters financially more attractive.

■ The liquid then flows through an expansion device that lowers its pressure, partly evaporating it and cooling it further to increase its potential to absorb heat in the evaporator again.

There's a number of different heat pump designs:

■ **Air-source heat pump:** The heat pump sits on top of the storage tank, forming a single unit. A fan forces air over the evaporator to heat up the refrigerant. The condenser can be a coil of tubing wrapped around the tank (**QUANTUM Turbo Compact Eyre** — see the diagram, left) or cold water from the tank can be pumped to the condenser, where it's heated by the heat-exchange fluid (**SOLAHART Sorcerer**).

■ **Solar-boosted heat pump:** The evaporator is located on the roof like a solar collector panel, and the tank is on the ground (**QUANTUM Standard Solar**). The refrigerant is pumped to the evaporator and heated by the surrounding air, solar radiation and even rain. It flows back into the condenser, which is a coil of tubing wrapped around the tank.

■ The heat pump is a separate unit that can be connected to any tank. Again, heat is extracted from air that's fan-forced over the evaporator. Cold water from the tank is pumped to the condenser, where it's heated by the refrigerant. The only model of this type is sold by Carrier-Apac. It was included in this test, but we were then told it was no longer being sold. A redesigned version was supposed to be available from November 1999.

The systems are profiled in rank order within types. A comparison of how they performed is given for each city in the tables, starting on page 35. Prices and installation costs are based on manufacturer information in September/October 1999. All the solar models have two collector panels, but extra panels are available (Beasley: \$500, Edwards: \$550, Solahart: \$600).

Solar pumped



COURTESY OF SOLAHART

SOLAHART Aurora 302A

Price: \$4200.
Installation: \$700.
Manufacturer/distributor: Solahart Industries.
Origin: Australia.
Warranty: Five years parts and labour.
Booster: Gas.
Tank volume: 315 L.
Tank material: Mild steel.
Weight of roof-mounted system: 69 kg.
Dimensions (area required on roof; W x D): 2044 x 1937 mm.
Performance: The best for CO₂ savings of all the tested systems in all regions where natural gas (for the booster) is available, except Rockhampton. However, it's also one of the most expensive to buy and install and is often disadvantaged by high gas tariffs, or tariffs that get cheaper the higher the consumption. So payback times are generally high.

SOLAHART 302SL

Price: \$4000.
Installation: \$600.
Manufacturer/distributor: Solahart Industries.
Origin: Australia.
Warranty: Five years parts and labour.
Booster: Electric.
Tank volume: 315 L.
Tank material: Mild steel.
Weight of roof-mounted system: 69 kg.
Dimensions (area required on roof; W x D): 2044 x 1937 mm.

Performance: This is the best of the electrically boosted pumped solar systems for CO₂ savings, due to the much lower flowrate of its pump. However, it's also the most expensive system of this type, so payback times are relatively long.

BEASLEY Centurion 12S-315L

Price: \$2950.
Installation: \$650.
Extra cost for twin-element tank (see Booster options, page 31): \$90.
Manufacturer/distributor: Beasley Industries.
Origin: Australia.
Warranty: One year parts and labour, plus another six years parts only for tank and panels.
Booster: Electric.
Tank volume: 315 L.
Tank material: Stainless steel.
Weight of roof-mounted system: 70 kg.
Dimensions (area required on roof; W x D): 1940 x 2160 mm.

Performance: Saves comparatively little energy, and CO₂, mainly due to the very high flowrate of its pump: the water in the tank is constantly mixed rather than thermally stratified, with the hot water at the top. This causes the thermostat to switch on the booster even during days when there are good solar conditions.

EDWARDS Economiser DES250

Price: \$2500.
Installation: \$500.
Extra cost for twin-element tank (see Booster options, page 31): \$72.
Manufacturer/distributor: Edwards Energy Systems.
Origin: Australia.
Warranty: One year on all parts and labour, plus nine years on the tank and six years on the panels.
Booster: Electric.
Tank volume: 300 L.
Tank material: Stainless steel.
Weight of roof-mounted system: 74 kg.
Dimensions (area required on roof; W x D): 2280 x 1980 mm.
Performance: Saves comparatively little energy and CO₂, mainly due to the very high flowrate of its pump: the water in the tank is constantly mixed rather than thermally stratified, with the hot water at the top. This causes the thermostat to switch on the booster even during days when there are good solar conditions.

Solar thermosiphon



COURTESY OF SOLAHART

SOLAHART 302BC XII

Price and installation: Varies from state to state. Check the tables on pages 35 to 37.
Manufacturer/distributor: Solahart Industries.
Origin: Australia.
Warranty: 12 years parts and labour.
Booster: Electric.
Tank volume: 300 L.
Tank material: Mild steel.
Weight of roof-mounted system: 477 kg.
Dimensions (area required on roof; W x D): 2090 x 2430 mm.
Performance: The best for CO₂ savings of all the electrically boosted solar systems tested. In regions with very high solar radiation (northern Australia in summer) it may even be too efficient and the system may overheat. The manufacturer recommends fitting a heat control device ('heat dump kit') in such areas. Except in Darwin, it's the most expensive thermosiphon system to buy, so payback times are relatively long.

EDWARDS LX305

Price: \$2450.
Installation: \$500.
Manufacturer/distributor: Edwards Energy Systems.
Origin: Australia.
Warranty: One year on all parts and labour, plus six years on the panels and the tank.
Booster: Electric.
Tank volume: 300 L.
Tank material: Stainless steel.
Weight of roof-mounted system: 460 kg.
Dimensions (area required on roof; W x D): 2280 x 2540 mm.
Performance: This is the second-best solar thermosiphon tested for CO₂ savings and one of

the cheapest systems overall, giving it the shortest payback times of all the tested models.

SOLAHART 302J

Price and installation: Varies from state to state.

Check the tables on pages 35 to 37.

Manufacturer/distributor: Solahart Industries.

Origin: Australia.

Warranty: Five years parts and labour.

Booster: Electric.

Tank volume: 300 L.

Tank material: Mild steel.

Weight of roof-mounted system: 472 kg.

Dimensions (area required on roof; W x D): 2090 x 2430 mm.

Performance: Not as good for CO₂ savings as the **EDWARDS** and **SOLAHART 302BC XII** thermosiphon systems, because the absorber doesn't have a selective surface. However, it's one of the cheapest systems in the test, so payback times are among the shortest.

BEASLEY Solar Prestige HTM300

Price: \$3100.

Installation: \$450.

Manufacturer/distributor: Beasley Industries.

Origin: Australia.

Warranty: One year parts and labour, plus another six years parts only for tank and panels.

Booster: Electric.

Tank volume: 300 L.

Tank material: Stainless steel.

Weight of roof-mounted system: 420 kg.

Dimensions (area required on roof; W x D): 2300 x 2450 mm.

Performance: This was the worst thermosiphon system in the test for CO₂ savings. While its absorber has a selective surface, overall efficiency is relatively low because of the wide spacing between the collector tubes and the comparatively small heat-exchange area.

Heat pumps



COURTESY OF QUANTUM

QUANTUM Standard Solar 270S2-S

Price: \$2350.

Installation: \$550.

Manufacturer/distributor: Quantum Energy Systems.

Origin: Australia.

Warranty: Seven years parts and labour on tank, condenser and evaporator panel, two years on heat pump and electrics.

Type: Solar-boosted heat pump.

Booster: Not applicable.

Tank volume: 270 L.

Tank material: Mild steel.

Weight of roof-mounted system: 30 kg.

Dimensions (area required on roof; W x D): 1950 x 2300 mm.

Performance: Due to the solar boost, this is the best of the tested heat pumps for CO₂ savings, performing particularly well compared to the solar systems in southern regions. Relatively attractive payback times.

QUANTUM Turbo Compact Eyre 270T2-EC

Price: \$2650.

Installation: \$200.

Manufacturer/distributor: Quantum Energy Systems.

Origin: Australia.

Warranty: Seven years parts and labour on tank and condenser, two years on heat pump and electrics.

Type: Air-source heat pump.

Booster: Not applicable.

Tank volume: 270 L.

Tank material: Mild steel.

Weight of roof-mounted system: Not applicable.

Dimensions (area required on roof; W x D): Not applicable.

Performance: Better for CO₂ savings than the **SOLAHART** heat pump and much cheaper, giving it relatively attractive payback times. It's the noisiest of the tested heat pumps.

SOLAHART Sorcerer 315HP

Price: \$4200.

Installation: \$300

Manufacturer/distributor: Solahart Industries.

Origin: Australia.

Warranty: Five years parts and labour.

Type: Air-source heat pump.

Booster: Not applicable.

Tank volume: 315 L.

Tank material: Mild steel.

Weight of roof-mounted system: Not applicable.

Dimensions (area required on roof; W x D): Not applicable.

Performance: Clearly the worst-performing of all the tested heat pumps, saving comparatively little energy and CO₂. It's also one of the most expensive systems in the test, giving it the longest payback times in most cities.



COURTESY OF SOLAHART

Which system's best for where you live?

Using a standard method and detailed weather data for three climate zones, we simulated a full year's operation for each of the systems and calculated the amount of electricity or gas they required.

Depending on how electricity is generated in your state or territory, each additional kWh consumed produces different amounts of CO₂ and other greenhouse gases. In most cases, one kWh creates around 1 kg of CO₂-equivalents (CO₂-equ; that's the greenhouse potential of all the emitted greenhouse gases expressed as CO₂). However, Victoria uses a lot of brown coal and 1 kWh produces about 1.4 kg CO₂-equ; Tasmania's hydroelectric schemes produce only 0.02 kg CO₂-equ per kWh, and in the NT the factor is about 0.8 kg CO₂-equ per kWh due to the use of diesel generators and natural gas. The CO₂-equ factor for natural gas throughout Australia is 0.06 kg per additional megajoule (MJ) consumed.

Electricity and gas tariffs vary hugely from city to city: in different places prices per unit (kWh or MJ) can become cheaper or dearer the more you use; some providers offer a range of peak and off-peak tariffs, others only one. Generally, there are three types of electricity tariff you might be able to choose for water heating:

- **Continuous or day-rate supply:** The most expensive tariff, where electricity is available for 24 hours a day to heat water.
- **Off-peak 1 or night supply:** The cheapest tariff, but electricity is only available for a number of hours during the night.
- **Off-peak 2 supply:** Priced somewhere between the other tariffs, electricity is available either for a number of hours during the night plus some hours in the afternoon, or for most of the day except the morning and evening peak hours. Some electricity providers don't offer this.

So how much — if any — CO₂ and money the tested system can save you depends on where you live. We've calculated savings of both for each capital city as well as Rockhampton in Queensland.

Note that many of the energy providers also cover areas outside the cities. So even if you don't live directly in any of the cities we've covered, you may still be on the same or very similar tariffs, and our results may also be valid for your area.

The calculations

For the calculations we used the CO₂-equ factors for each state and territory, and 'connected' each of the tested systems to the off-peak 2 supply where it's available. Where it isn't, we chose continuous supply, as is recommended by most manufacturers. (Alternatively, you could buy a system with a larger tank and connect it to the cheaper off-peak 1 night supply.) Based on these 'connections', we calculated the CO₂ savings and payback times compared with four conventional systems (see *How to read the tables*, below).

In cities with tiered tariffs that increase (or decrease) depending on the amount of energy you use (which is often the case for gas), we assumed the water heater to be the 'first' appliance in the household, and applied the different tiers of the tariff to the energy it consumed.

Booster off in summer

With solar systems you can usually get a control switch that allows you to override the thermostat and switch the booster on and off as required.

The calculations assume such a control is installed and that the electric or gas booster is switched off during summer, letting the sun do all the work. Many of you who wrote to us about your experiences with solar water heaters have been doing this successfully.

However, this means you have to manage your hot-water supply more actively. If it's overcast for several days, your system may still produce water hot enough for a shower, but it may not heat the tank to above 55°C, which is necessary to kill bacteria such as legionella. In such cases it's up to you to switch on the booster to ensure the tank is heated to that temperature at least once a day.

If that sounds like too much trouble, you can of course leave the booster element control switched on all the time. In this case your CO₂ savings may be a few hundred kilograms per year less and the payback time around half a year to a year longer than the figures in our tables.

How to read the tables

The tested systems are compared to four conventional water-heater systems, sized for an average four-person household:

- 1 Off-peak electric**
Electric system with a 315 L tank connected to off-peak 1 supply, where available.
- 2 Day-rate (continuous) electric**
Electric system with a 150 L tank connected to continuous supply.
- 3 Standard gas**
Standard gas system with a 140 L tank.
- 4 High-efficiency gas**
High-efficiency gas system with a 135 L tank.

Check your city's table for the systems with the best CO₂ savings and short payback times, and then refer to the profiles on pages 32–33 for details of the systems.

CO₂ savings

For each city the models are ranked in order of their CO₂ savings per year, which are rounded to the nearest 10 kg. **If a system doesn't save any CO₂, the table reads '0',** and it's not recommended as an alternative to that particular conventional system in that particular city.

Payback time

The payback times are based on recommended retail prices and average installation costs for the tested systems (shop around and get several

quotes for the system you're interested in — you may be able to get a better deal). The assumption is that you have to replace your existing hot-water system, and we've therefore subtracted the average amount it would have cost you to buy and install the conventional heater.

- If a tested model costs more to run than a conventional system, it of course **never pays off** and the table reads 'na' — **not applicable**.
- Payback times of **more than 15 years** aren't very meaningful — you might easily move in that time — so the table only reads '>15'.

Adelaide

■ **CO₂:** Considerable savings compared to conventional electric systems, but compared to standard gas heaters, only the best solar models can be recommended; compared to a high-efficiency gas heater only the **SOLAHART 302SL** and **Aurora 302A**.

■ **Payback time:** There's no off-peak 2 tariff so the systems are likely to be connected to the more expensive continuous day-rate. Gas gets cheaper as you use more. These tariff structures mean payback times are reasonable only compared with a conventional electric day-rate system.

ADELAIDE: Carbon dioxide savings per year and payback time in years compared to four conventional water heater types

Brand / model (in order of CO ₂ savings)	Type	Purchase price / typical installation cost (\$)*	1		2		3		4	
			CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***
SOLAHART Aurora 302A	Pumped gas	4200 / 700	3650	> 15	3470	10.5	990	> 15	550	> 15
SOLAHART 302BC XII	Thermosiphon	3750 / 600	3210	> 15	3030	9.5	550	> 15	110	> 15
EDWARDS LX305	Thermosiphon	2450 / 500	3010	> 15	2820	6.5	340	13.5	0	> 15
SOLAHART 302SL	Pumped electric	4000 / 600	2930	> 15	2740	11.0	270	> 15	0	> 15
SOLAHART 302J	Thermosiphon	2600 / 600	2780	> 15	2600	8.0	120	> 15	0	> 15
QUANTUM Standard Solar 270-S2-S	Heat pump	2350 / 550	2700	> 15	2520	7.0	40	> 15	0	> 15
BEASLEY Solar Prestige HTM300	Thermosiphon	3100 / 450	2610	na	2430	9.5	0	> 15	0	> 15
QUANTUM Turbo Compact Eyre 270T2-EC	Heat pump	2650 / 200	2460	na	2270	7.5	0	> 15	0	> 15
SOLAHART Sorcerer 315HP	Heat pump	4200 / 300	1960	na	1780	> 15	0	> 15	0	na
BEASLEY Centurion 125-315L	Pumped electric	2950 / 650	1810	na	1630	14.0	0	> 15	0	na
EDWARDS Economiser DES250	Pumped electric	2500 / 500	1770	na	1580	11.5	0	> 15	0	na

na Not applicable: no money savings.

ROCKHAMPTON: Carbon dioxide savings per year and payback time in years compared to four conventional water heater types

Brand / model (in order of CO ₂ savings)	Type	Purchase price / typical installation cost (\$)*	1		2		3		4	
			CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***
SOLAHART 302BC XII	Thermosiphon	3750 / 600	3200	> 15	2970	9.5	1030	9.0	630	11.5
SOLAHART Aurora 302A	Pumped gas	4200 / 700	3060	> 15	2840	14.0	890	13.0	490	> 15
EDWARDS LX305	Thermosiphon	2450 / 500	3030	> 15	2810	6.0	860	5.5	460	6.5
SOLAHART 302SL	Pumped electric	4000 / 600	2810	> 15	2590	11.0	640	10.0	250	13.0
SOLAHART 302J	Thermosiphon	2650 / 600	2800	> 15	2570	7.5	630	6.5	230	8.0
BEASLEY Solar Prestige HTM300	Thermosiphon	3100 / 450	2570	> 15	2340	8.5	400	7.5	0	10.0
QUANTUM Standard Solar 270-S2-S	Heat pump	2350 / 550	2330	> 15	2110	7.0	160	6.0	0	7.5
QUANTUM Turbo Compact Eyre 270T2-EC	Heat pump	2650 / 200	2200	> 15	1980	7.0	30	6.0	0	8.0
BEASLEY Centurion 125-315L	Pumped electric	2950 / 650	1780	> 15	1560	10.0	0	9.0	0	12.5
EDWARDS Economiser DES250	Pumped electric	2500 / 500	1760	> 15	1540	8.0	0	7.0	0	9.5
SOLAHART Sorcerer 315HP	Heat pump	4200 / 300	1730	> 15	1510	13.5	0	12.0	0	> 15

SYDNEY: Carbon dioxide savings per year and payback time in years compared to four conventional water heater types

Brand / model (in order of CO ₂ savings)	Type	Purchase price / typical installation cost (\$)*	1		2		3		4	
			CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***
SOLAHART Aurora 302A	Pumped gas	4200 / 700	3650	> 15	3470	12.5	990	> 15	550	> 15
SOLAHART 302BC XII	Thermosiphon	3750 / 500	3210	> 15	3030	10.5	550	> 15	110	> 15
EDWARDS LX305	Thermosiphon	2450 / 500	3010	> 15	2820	7.0	340	11.5	0	> 15
SOLAHART 302SL	Pumped electric	4000 / 600	2930	> 15	2740	12.0	270	> 15	0	> 15
SOLAHART 302J	Thermosiphon	2650 / 500	2780	> 15	2600	8.0	120	13.5	0	> 15
QUANTUM Standard Solar 270-S2-S	Heat pump	2350 / 550	2700	> 15	2520	7.0	40	12.5	0	> 15
BEASLEY Solar Prestige HTM300	Thermosiphon	3100 / 450	2610	> 15	2430	9.5	0	> 15	0	> 15
QUANTUM Turbo Compact Eyre 270T2-EC	Heat pump	2650 / 200	2460	> 15	2270	7.5	0	13.5	0	> 15
SOLAHART Sorcerer 315HP	Heat pump	4200 / 300	1960	> 15	1780	15.0	0	> 15	0	> 15
BEASLEY Centurion 125-315L	Pumped electric	2950 / 650	1810	na	1630	11.5	0	> 15	0	> 15
EDWARDS Economiser DES250	Pumped electric	2500 / 500	1770	na	1580	9.5	0	> 15	0	> 15

na Not applicable: no money savings.

Rockhampton

As there's no natural gas in Darwin, Rockhampton demonstrates how the tested systems compare to conventional gas water heaters in northern Australia.

■ **CO₂:** There are big savings compared to conventional electric systems. Most of the tested models also produce less than a conventional standard gas heater, but only the best solar models can save over high-efficiency gas systems.

■ **Payback time:** There's an off-peak 2 electricity tariff to connect a solar system to, so payback times compare well with conventional electric day-rate systems. Gas is relatively expensive, so payback times are also good compared with gas systems (except for the **SOLAHART Aurora 302A** and **Sorcerer 315HP**).

Sydney

■ **CO₂:** See Adelaide.

■ **Payback time:** There's an electric off-peak 2 tariff to connect a solar system to, so payback times are attractive compared to conventional electric day-rate systems.

* Based on manufacturer information in September/October 1999, rounded to the nearest \$50.
** Rounded to the nearest 10 kg.
*** Rounded to the nearest half year.

SOLAR WATER HEATERS

Brisbane

■ **CO₂:** See Adelaide.
 ■ **Payback time:** There's an off-peak 2 electricity tariff to connect a solar system to, so payback times are attractive compared to conventional electric day-rate systems. Gas is generally relatively expensive, so some models compare well with standard gas heaters.

BRISBANE: Carbon dioxide savings per year and payback time in years compared to four conventional water heater types

Brand / model (in order of CO ₂ savings)	Type	Purchase price / typical installation cost (\$)*	1		2		3		4	
			Off-peak 1 electric	Day-rate electric	Standard gas	High-efficiency gas	CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***
SOLAHART Aurora 302A	Pumped gas	4200 / 700	3650	> 15	3470	12.0	990	> 15	550	> 15
SOLAHART 302BC XII	Thermosiphon	3750 / 600	3210	> 15	3030	9.0	550	12.5	110	> 15
EDWARDS LX305	Thermosiphon	2450 / 500	3010	> 15	2820	5.5	340	7.5	0	10.0
SOLAHART 302SL	Pumped electric	4000 / 700	2930	> 15	2740	10.0	270	14.0	0	> 15
SOLAHART 302J	Thermosiphon	2650 / 600	2780	> 15	2600	6.5	120	9.5	0	12.5
QUANTUM Standard Solar 270-S2-S	Heat pump	2350 / 550	2700	> 15	2520	6.0	40	8.0	0	11.0
BEASLEY Solar Prestige HTM300	Thermosiphon	3100 / 450	2610	> 15	2430	7.5	0	11.0	0	15.0
QUANTUM Turbo Compact Eyre 270T2-EC	Heat pump	2650 / 200	2460	> 15	2270	6.0	0	8.5	0	11.5
SOLAHART Sorcerer 315HP	Heat pump	4200 / 300	1960	> 15	1780	11.5	0	> 15	0	> 15
BEASLEY Centurion 125-315L	Pumped electric	2950 / 650	1810	> 15	1630	9.0	0	14.0	0	> 15
EDWARDS Economiser DES250	Pumped electric	2500 / 500	1770	> 15	1580	7.0	0	11.0	0	> 15

Canberra

■ **CO₂:** See Adelaide.
 ■ **Payback time:** There's an off-peak 2 tariff to connect a solar system to, but no off-peak 1. Some of the best solar models compare well with conventional electric day-rate systems.

CANBERRA: Carbon dioxide savings per year and payback time in years compared to four conventional water heater types

Brand / model (in order of CO ₂ savings)	Type	Purchase price / typical installation cost (\$)*	1		2		3		4	
			Off-peak 2 electric	Day-rate electric	Standard gas	High-efficiency gas	CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***
SOLAHART Aurora 302A	Pumped gas	4200 / 700	3820	> 15	3640	> 15	1160	> 15	710	> 15
SOLAHART 302BC XII	Thermosiphon	3750 / 500	3210	> 15	3030	12.5	550	> 15	110	> 15
EDWARDS LX305	Thermosiphon	2450 / 500	3010	13.0	2820	8.0	340	10.0	0	14.0
SOLAHART 302SL	Pumped electric	4000 / 600	2930	> 15	2740	14.0	270	> 15	0	> 15
SOLAHART 302J	Thermosiphon	2650 / 500	2780	> 15	2600	9.0	120	11.5	0	> 15
QUANTUM Standard Solar 270-S2-S	Heat pump	2350 / 550	2700	14.0	2520	8.5	40	10.5	0	> 15
BEASLEY Solar Prestige HTM300	Thermosiphon	3100 / 450	2610	> 15	2430	10.5	0	13.5	0	> 15
QUANTUM Turbo Compact Eyre 270T2-EC	Heat pump	2650 / 200	2460	15.0	2270	8.5	0	11.0	0	> 15
SOLAHART Sorcerer 315HP	Heat pump	4200 / 300	1960	> 15	1780	> 15	0	> 15	0	> 15
BEASLEY Centurion 125-315L	Pumped electric	2950 / 650	1810	> 15	1630	13.0	0	> 15	0	> 15
EDWARDS Economiser DES250	Pumped electric	2500 / 500	1770	> 15	1580	10.5	0	14.0	0	> 15

Darwin

There's no reticulated natural gas in Darwin, so we can't compare the tested models to gas water heaters. It also means there are no results for the gas-boosted SOLAHART Aurora 302A.

There's only a day rate for electricity, so there are no results for a conventional electric off-peak system either.

■ **CO₂:** The CO₂-equ factor in the NT is 0.8 kg/kWh, so the savings aren't as high as in some other states.

■ **Payback time:** Most models compare well with a conventional electric day-rate system.

DARWIN: Carbon dioxide savings per year and payback time in years compared to a conventional day-rate electric water heater

Brand / model (in order of CO ₂ savings)	Type	Purchase price / typical installation cost (\$)*	2	
			Day-rate electric	Payback time (years)***
SOLAHART 302BC XII	Thermosiphon	2700 / 450	2380	6.5
EDWARDS LX305	Thermosiphon	2450 / 500	2250	6.0
SOLAHART 302SL	Pumped electric	4000 / 600	2070	11.5
SOLAHART 302J	Thermosiphon	2550 / 450	2060	7.0
BEASLEY Solar Prestige HTM300	Thermosiphon	3100 / 450	1880	9.5
QUANTUM Standard Solar 270-S2-S	Heat pump	2350 / 550	1690	8.0
QUANTUM Turbo Compact Eyre 270T2-EC	Heat pump	2650 / 200	1580	8.5
BEASLEY Centurion 125-315L	Pumped electric	2950 / 650	1250	14.5
EDWARDS Economiser DES250	Pumped electric	2500 / 500	1230	11.5
SOLAHART Sorcerer 315HP	Heat pump	4200 / 300	1210	> 15
SOLAHART Aurora 302A	Pumped gas	4200 / 700	na	na

na Not applicable: there's no reticulated natural gas in Darwin to operate this system's booster.

* Based on manufacturer information in September/October 1999, rounded to the nearest \$50.
 ** Rounded to the nearest 10 kg. While all the systems save so little CO₂ in Hobart that it's not worth giving the numbers, they're still ranked in order of CO₂ savings for that city.
 *** Rounded to the nearest half year.

Hobart

There's no reticulated natural gas in Hobart, so we can't compare the tested models to gas water heaters. It also means there are no results for the gas-boosted

SOLAHART Aurora 302A.

■ **CO₂:** Due to the use of hydroelectricity, the CO₂-equ factor in Tasmania is only 0.02 kg/kWh. While solar and heat-pump water heaters need less energy than conventional systems, they only save minimal amounts of CO₂. However, using them may still contribute to preventing the need for additional dams or power stations.

■ **Payback time:** While there's an electric off-peak 2 tariff to connect a solar system to, even the day-rate tariff is relatively cheap. None of the tested systems is likely to pay for itself in a reasonable time.

HOBART: Carbon dioxide savings per year and payback time in years compared to two conventional electric water heater types

Brand / model (in order of CO ₂ savings)	Type	Purchase price / typical installation cost (\$)*	1		2	
			Off-peak 1 electric	Day-rate electric	Off-peak 1 electric	Day-rate electric
			CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***
QUANTUM Standard Solar 270-S2-S	Heat pump	2350 / 550	Little	11.5	Little	10.5
SOLAHART 302BC XII	Thermosiphon	3750 / 600	Little	> 15	Little	> 15
SOLAHART 302SL	Pumped electric	4000 / 600	Little	> 15	Little	> 15
EDWARDS LX305	Thermosiphon	2450 / 500	Little	14.0	Little	12.0
QUANTUM Turbo Compact Eyre 270T2-EC	Heat pump	2650 / 200	Little	13.0	Little	11.5
BEASLEY Solar Prestige HTM300	Thermosiphon	3100 / 450	Little	> 15	Little	> 15
SOLAHART 302J	Thermosiphon	2600 / 600	Little	> 15	Little	14.5
SOLAHART Sorcerer 315HP	Heat pump	4200 / 300	Little	> 15	Little	> 15
BEASLEY Centurian 125-315L	Pumped electric	2950 / 650	Little	> 15	Little	> 15
EDWARDS Economiser DES250	Pumped electric	2500 / 500	Little	> 15	Little	> 15
SOLAHART Aurora 302A	Pumped gas	4200 / 700	na	na	na	na

na Not applicable: there's no reticulated natural gas in Hobart to operate this system's booster.

Melbourne

■ **CO₂:** The CO₂ factor for electricity is 1.4 kg/kWh, which means the tested systems can save up to \$650 kg of CO₂ per year compared to conventional electric systems. However, all but the gas-boosted SOLAHART Aurora 302A produce more CO₂ than conventional gas heaters.

■ **Payback time:** Gas is relatively cheap, and there's no electric off-peak 2 tariff to connect a solar system to, so the solar systems would probably be connected to day-rate. Consequently, there are no money savings to speak of compared to conventional electric off-peak and gas systems. Payback times are reasonable for most models compared to conventional electric day-rate systems.

MELBOURNE: Carbon dioxide savings per year and payback time in years compared to four conventional water heater types

Brand / model (in order of CO ₂ savings)	Type	Purchase price / typical installation cost (\$)*	1		2		3		4	
			Off-peak 1 electric	Day-rate electric	Standard gas	High-efficiency gas	Off-peak 1 electric	Day-rate electric	Standard gas	High-efficiency gas
			CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***
SOLAHART Aurora 302A	Pumped gas	4200 / 700	5650	> 15	5410	9.5	880	> 15	410	> 15
QUANTUM Standard Solar 270-S2-S	Heat pump	2350 / 550	4090	na	3850	6.5	0	> 15	0	na
SOLAHART 302SL	Pumped electric	4000 / 600	3900	na	3670	12.5	0	na	0	na
SOLAHART 302BC XII	Thermosiphon	3750 / 600	3860	na	3620	12.0	0	na	0	na
QUANTUM Turbo Compact Eyre 270T2-EC	Heat pump	2650 / 200	3580	na	3350	7.5	0	na	0	na
EDWARDS LX305	Thermosiphon	2450 / 500	3550	na	3320	8.0	0	na	0	na
SOLAHART 302J	Thermosiphon	2600 / 600	3300	na	3070	10.0	0	na	0	na
BEASLEY Solar Prestige HTM300	Thermosiphon	3100 / 450	3200	na	2970	11.5	0	na	0	na
SOLAHART Sorcerer 315HP	Heat pump	4200 / 300	2940	na	2710	> 15	0	na	0	na
BEASLEY Centurian 125-315L	Pumped electric	2950 / 650	2030	na	1790	> 15	0	na	0	na
EDWARDS Economiser DES250	Pumped electric	2500 / 500	1980	na	1750	> 15	0	na	0	na

na Not applicable: no money savings.

PERTH: Carbon dioxide savings per year and payback time in years compared to four conventional water heater types

Brand / model (in order of CO ₂ savings)	Type	Purchase price / typical installation cost (\$)*	1		2		3		4	
			Off-peak 1 electric	Day-rate electric	Standard gas	High-efficiency gas	Off-peak 1 electric	Day-rate electric	Standard gas	High-efficiency gas
			CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***	CO ₂ saved per year (kg)**	Payback time (years)***
SOLAHART Aurora 302A	Pumped gas	4200 / 700	3650	> 15	3470	10.5	990	> 15	550	> 15
SOLAHART 302BC XII	Thermosiphon	3700 / 450	3210	> 15	3030	8.0	550	11.5	110	15.0
EDWARDS LX305	Thermosiphon	2450 / 500	3010	12.5	2820	5.5	340	8.0	0	10.0
SOLAHART 302SL	Pumped electric	4000 / 600	2930	> 15	2740	9.5	270	14.5	0	> 15
SOLAHART 302J	Thermosiphon	2700 / 400	2780	15.0	2600	6.0	120	9.0	0	12.0
QUANTUM Standard Solar 270-S2-S	Heat pump	2350 / 550	2700	14.5	2520	5.5	40	8.5	0	11.5
BEASLEY Solar Prestige HTM300	Thermosiphon	3100 / 450	2610	> 15	2430	6.0	0	9.0	0	12.5
QUANTUM Turbo Compact Eyre 270T2-EC	Heat pump	2650 / 200	2460	> 15	2270	6.0	0	9.0	0	13.0
SOLAHART Sorcerer 315HP	Heat pump	4200 / 300	1960	> 15	1780	11.5	0	> 15	0	> 15
BEASLEY Centurian 125-315L	Pumped electric	2950 / 650	1810	> 15	1630	9.5	0	> 15	0	> 15
EDWARDS Economiser DES250	Pumped electric	2500 / 500	1770	> 15	1580	7.5	0	13.5	0	> 15

Perth

■ **CO₂:** See Adelaide.

■ **Payback time:** There's an off-peak 2 tariff to connect a solar system to, so payback times are quite attractive compared to conventional day-rate systems. Gas is relatively expensive, so most of the best solar models compare well with standard gas systems.

Getting into hot water

Heating water can account for a large chunk of your household's energy bills. Save money by choosing the right type and size of water heater for you.

IN THIS ARTICLE

- Gas, electricity or sun — the pros and cons of different energy sources.
- Storage or instantaneous heater — which system is best for your needs?
- Tips on how to reduce your hot-water bill.

WHEN YOUR WATER HEATER DIES it's a disaster — you want it replaced immediately. So most people end up simply buying the same again.

But if you'd already thought about how much you spend on heating water and had researched the options, you could be on the road to saving money. You could also pick a system that's kinder to the environment. So what do you need to think about to do both of these things?

Which fuel?

The most common fuels used for water heating are gas and electricity.

■ Electric water heaters that can heat water at any time of day are by far the most expensive option. Off-peak electric (which heat only when tariffs are lower) and gas systems have similar costs, depending on the tariffs you have to pay.

■ Natural gas produces much less of the greenhouse gas carbon dioxide (CO₂) than electricity to heat the same amount of water. But it's not available everywhere.

■ You can also get *Hot water from sun and air* — see the test report on page 29 for how solar and heat-pump water heaters compare to conventional systems.

Which type?

There are two main types of water heater: storage and instantaneous.

Storage water heaters

The water is heated to a relatively high set temperature (usually between 60°C and 70°C) and kept ready for use in a tank. When you use hot water, it's drawn from the top of the tank and replaced by a layer of cold water at the bottom. The temperature drop is sensed by a thermostat, which turns on the heater at the bottom of the tank.

Although the tank is insulated, it's constantly losing energy. So the water temperature drops over time unless it's reheated. If you draw off hot water faster than the cold water can be heated up, the cold layer can eventually move to the top of the tank — and you'll run out of hot water.

Tank materials

Storage tanks must withstand high water temperatures and pressure, and they have to be protected against corrosion.

— **Mild-steel** tanks are protected from water corrosion by a lining of one or two layers of spun glass, often called vitreous enamel. The mild steel can also be corroded by forming an electrolytic cell with copper water pipes, which are common. These tanks therefore have a magnesium rod (called a sacrificial anode) inside them that corrodes first, and which you need to replace every few years in order to prevent damage to the tank. Mild-steel tanks usually have five- to 10-year warranties.

— **Stainless steel** is resistant to water and electrolytic corrosion. Tanks made from it are more expensive to buy, but generally last longer and don't require the maintenance and ongoing costs of mild-steel tanks. They usually carry a 10-year warranty.

Heater types

■ Electric

Electric systems have to meet minimum energy performance standards regarding the tank's heat loss.

Most electricity providers offer a choice of tariffs for water heaters.

If you connect your heater to a **continuous** or

How to save on your hot-water bill

- Find the best **fuel** and **type of heater** for your situation.
- Depending on where you live, consider a **solar** or **heat-pump** water heater (see *Hot water from sun and air*, page 29, for test results and cost comparisons).
- If you have a **storage system**, make sure the tank and hot-water pipes are well insulated. Limit the water temperature to around 60°C if possible. Install it as close to the main hot-water outlets as possible. Turn it off when you go away for more than a couple of days.
- Try to **save water**:
 - Take showers instead of baths, and limit them to about five minutes.
 - Get low-flow shower heads (see the test of water-efficient shower heads in CHOICE, December 1998) and taps (ideally with AAA water conservation rating), or install flow restrictors.
 - Consider a front-loading washing machine the next time you have to replace yours.
- See the calculator on www.choice.com.au/environment/savewater.asp for more tips on how to save water and money.

day-rate supply, electricity is available 24 hours a day and the heater can replace tank heat losses and hot water that's been drawn off relatively quickly. You're unlikely to run out of hot water — at least not for very long. So the tank can be smaller than with an off-peak system (see below) and you'll save on the purchase cost. A four-person household needs a tank of about 125–160 L. However, the high day-rate tariff makes this type the most expensive to run.

Off-peak 1 or night-rate systems only receive power for a period during the night. Tank heat losses and hot water that's drawn off can't be replaced until the following night. So you need a large tank that can cope with your day's demand, otherwise you may end up without hot water (about 250–315 L for a four-person household). You can get a **twin-element** tank (see diagram below). The bottom element is connected to off-peak supply and does most of the heating. If you run low on hot water, a second element connected to continuous supply kicks in to heat a small portion of water at the top of the tank.

■ Gas

Gas water heaters have a gas energy rating label: the more stars on the label, the more efficient the heater. There are **standard** and **high-efficiency** gas storage heaters. High-efficiency models are more expensive to buy, but cheaper and more environmentally friendly to run.

Gas storage heaters only require relatively small tanks, as gas is available 24 hours a day and heat losses can be replaced quickly. A four-person household needs a tank of about 135–170 L. Gas heaters can be installed externally, or internally with a flue, which may require more installation work (and cost) than an electric system. Some gas suppliers have a special tariff for gas storage water heaters.

■ Solar and heat-pump

See the test report in this issue, page 29, for details.

Instantaneous water heaters

This type only heats as much water as you need, when you need it. If you turn on the tap, cold water flows through a heat exchanger, igniting a gas burner or switching on an electric element. So there are no heat losses, and as long as there's gas or electricity, you'll never run out of hot water.

Talk to your supplier to find the capacity (litres per hour) most suitable for your situation.

Heater types

■ Electric

Electric instantaneous water heaters have to be connected to the day-rate tariff, so the running costs will probably be higher than with an off-peak storage system. However, because there's no tank to lose heat, they're cheaper to run than day-rate storage heaters. Modern models have better temperature control than older ones you might have come across.

■ Gas

With older models, the water temperature varied depending on the water flow: the more cold water running through the heat exchanger, the lower the temperature. However, modern systems have a thermostat that ensures a constant temperature up to the model's maximum flowrate. Only if you draw water at a higher rate than that will the temperature drop.

On sophisticated computer-controlled models, you can select different temperatures for different water outlets — 55°C in the kitchen and laundry, say, and 40°C in the bathroom (to avoid the risk of scalding).

Standard models have a pilot light, which wastes a certain amount of gas. Models with battery ignition are more economical. Gas instantaneous heaters can be installed externally, or internally with a flue. As there are no tank heat losses, they're likely to be cheaper to run than gas storage systems. □

Gravity-fed systems

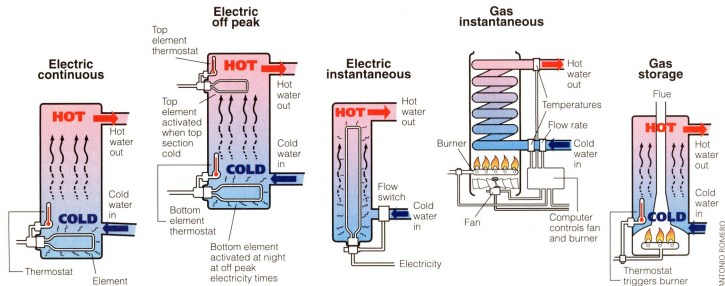
If you're not connected to the mains water supply, you'll have a gravity-fed hot-water system.

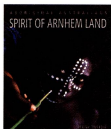
You're probably aware of the main disadvantage: as the hot-water pressure depends on the height difference between the tank in the roof space and the water outlet, it's usually not enough to allow several hot-water outlets to draw from the tank at the same time.

However, these systems don't require much maintenance, and can last for a very long time. And you can connect solar collector panels.



For tips on helping the environment in your home, see the **CHOICE Book Sustainable House** (order form page 42).



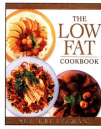


Aboriginal Australians: Spirit of Arnhem Land

Photographer Penny Tweedie records the beauty and culture of a land and its people. She first visited Arnhem Land

in 1975, and some of her subjects appear twice, in photos taken 18 years apart. The explanatory captions come from these people and, with the stunning photography, illuminate their way of life. A great gift book.

\$60 Code: SOAL

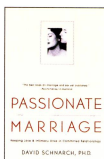


The Low Fat Cookbook

For many reasons people want to reduce fat in their diet, but they don't want to feel deprived of eating pleasure. This low-fat cookbook shows that low fat doesn't necessarily

mean deprivation. It even has a section of chocolate recipes including truffles and cake! Each recipe includes a nutrition panel listing fat content, cholesterol, sodium and calories. It also includes useful hints and techniques for reducing fat in your diet.

\$35 Code: TLFC

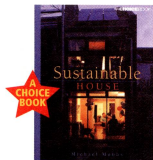


Passionate Marriage

Marriage (or long-term partnership), says the American author, isn't easy. With more people living longer and staying fit, physically and mentally, what's the point of marriage if you're living in a 'dead' relationship?

A personal, explicit yet unsensational book that is as much about making an intimate partnership work as it is about achieving sexual satisfaction.

\$30 Code: PAMA



Sustainable House

Read how an inner-city house was renovated to be almost completely self-sustaining for water and electricity while still being a comfortable home. *Sustainable House* includes advice for home owners, builders, architects and councils, a list of contacts and suppliers, and is extensively illustrated.

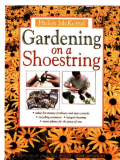
\$35 Code: SUSH



Safer Pest Control for Homes and Gardens

Anyone who uses pesticides in their home or garden should consult this book about the potential dangers and safer options. It provides useful information about how common pesticides work, what pests they work on and when not to use them.

\$16 Code: SPC



Gardening on a Shoestring

Have a beautiful garden without spending a fortune. This book includes advice about garden design, planting, watering and essential gardening tools. With careful buying, propagation and a bit of work you too can have a beautiful garden for little cost.

\$20 Code: GOAS



The New Hard Times Handbook

Some of the best ideas come from hard times — this book presents many ideas and hints for living frugally while still having a wonderful lifestyle. If the lights go out, the water is undrinkable or there's no gas to cook with, this book offers alternatives.

\$18 Code: NHTH

Are you buying or using the best computer for your needs?

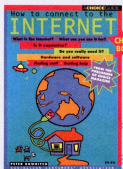
Australian computer guide series



Now available as a set of 3 for \$24

Save \$6

(Code: COMP)



How to Connect to the Internet

Whether you want to use the Internet for business or pleasure, this book will point you in the right direction.

\$10 Code: NET



How to Buy a Computer

Third edition

What you need to know when buying a computer, including a handy checklist to take with you when shopping around.

\$10 Code: HBC3



How to Get More From Your Computer

Buying a computer is just the start; this guide helps you make the most of this useful piece of technology.

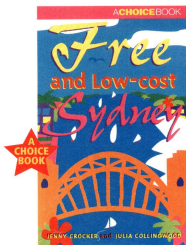
\$10 Code: HGMC

Free and Low-cost Sydney

"...this wonderful book ... has ideas for both adults and children" *Sydney Morning Herald*

This summer enjoy Sydney without it costing you a bomb. *Free and Low-cost Sydney* tells you about the free and cheap sites and activities available. It includes contact numbers and web addresses, opening hours, addresses, charges (if any), maps and tips on transport for activities in and outside the CBD.

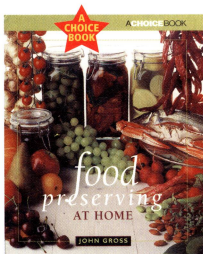
\$15 Code: FLCS



Food Preserving At Home

Eat well all year round and take advantage of those seasonal food gluts by preserving fresh food with the help of this book. It gives practical advice about all sorts of preserving, including drying, canning (bottling), smoking, pickling and freezing. Written for Australian conditions, it has easy-to-understand terminology and instructions.

\$27 Code: FPAH

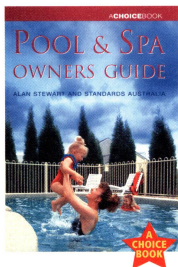


Pool and Spa Owners Guide

This new CHOICE Book tells you all you need to know about maintaining a trouble-free swimming pool or spa, while saving money at the same time. It also has help for those about to install their first pool.

Illustrated with easy-to-follow diagrams and written in plain language, this guide will help you get the most out of your pool or spa.

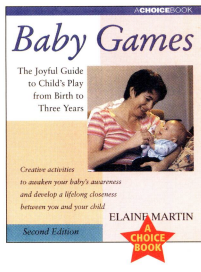
\$25 Code: PSOG



Baby Games

Playing with your baby creates special bonds of love, communication and caring that will last a lifetime. As your child grows from infant to toddler to preschooler, *Baby Games* offers rhymes, songs, finger plays, activities and games to help create a magical childhood. Whether you're a new parent who has forgotten the words to 'Rock-a-Bye Baby' or an experienced parent who needs some new ideas for the nursery, this is your guide to playing joyfully with your child.

\$20 Code: BGCB

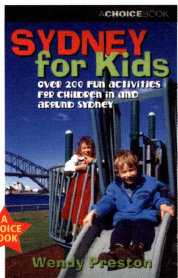


Sydney for Kids

Anyone living in or visiting Sydney with kids should have a copy of *Sydney for Kids*.

It has all the information you'll need to visit over 200 exciting venues in and around Sydney and take part in activities suitable for babies and children up to 12 years old. It includes details such as how to get there, which age group will enjoy it most, prices, contact details and opening hours. Free and cheap activities are also included.

\$15 Code: SFK

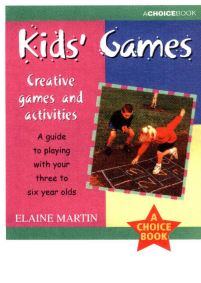


Kids' Games

From the author of *Baby Games*, here is the activity book for children aged three to six.

Full of fun and variety, it's carefully geared to the child's age, physical development and personal interests. Each chapter contains a selection of games, songs, rhymes and crafts that will both delight and motivate. From recipes to sports, arts and crafts to science projects, *Kids' Games* offers hours of entertainment and education for your child, and for you.

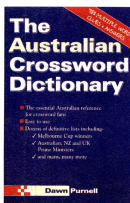
\$20 Code: KGCB



Australian Crossword Dictionary

This summer sit back and do a crossword, and when it gets a bit too hard get this book out to help. It's specifically written for an Australian audience and includes single and multiple word clues. So when you need an eight-letter word for loincloth beginning with 'L' you'll be able to find it.

\$13 Code: ACD



The Australian Kitchen Companion

A useful kitchen guide for anyone, but especially those moving away from home for the first time. It explains different ingredients, techniques and cooking temperatures, includes a culinary dictionary, weights and measures converter, advice on working with a microwave oven, recipes and 202 helpful hints to solve kitchen problems.

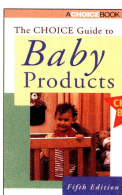
\$10 Code: TAKC



The CHOICE Guide to Baby Products

If you know anyone who's expecting, this could be one of the best presents you'll ever give them. *The CHOICE Guide to Baby Products* provides useful product advice about a number of baby products and includes information about other baby issues, such as safety around the home, immunisation and childcare.

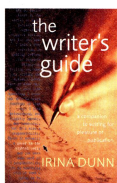
\$17 Code: CBPS



The Writer's Guide

The Writer's Guide has a wealth of information for both the first-time and the experienced writer. It includes advice about everything from doing your research to finding publishing outlets and marketing your work.

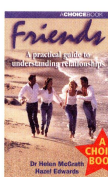
\$25 Code: TWG



Friends

Over the holiday season you'll probably see a lot of your friends — and you may miss some you no longer see. Make an effort to keep the friends you have and make better new relationships by reading *Friends* and applying its advice about these important relationships. *Friends* includes case studies, questionnaires and quizzes to develop your understanding of the role your friends play in your life.

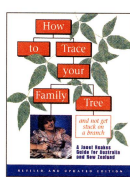
\$17 Code: FREN



Trace Your Family Tree

In the last month of the 20th century, why not prepare your family history for those of the 21st century to read? This Australian book explains what information is available and how you can access it. It also includes advice about recording your work. Prepare for the future by recording your past.

\$17 Code: HTFT



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CB/9912

Summer's here, bringing lazy afternoons in the sun, weekends at the beach and ... cockroaches. How can you keep your house roach-free this year?



Murder, mayhem and massacre

NO MATTER WHAT YOUR STRATEGY, it's hard to get rid of cockroaches completely — they get everywhere. One reader told us three hopped inside the wrapping on a present for her son; another intrepid group managed to cage a lift with a NASA space shuttle (as part of an experiment).

Not only are cockroaches unpleasant to come across in your kitchen, they're also a health hazard. If they've been hanging out in gutters or sewers, they could bring all sorts of germs into your home. A 1997 study found that asthmatic children who were also allergic to cockroaches were hospitalised three times as often as those not allergic to roaches.

Bomb, spray or bait?

There's a bewildering range of products available for combating cockies, so which is best? It depends on your home and the type of cockroaches, and it's worth trying various methods.

Bombs

If your home is infested, try hitting your cockroach population with a bomb. Bombs are very efficient in the short term because they're the best way of getting into the cracks and crevices where cockroaches live and breed. Those in the test gave very similar results, so just go for the cheapest. They all killed all the cockies on day one, though some took a little longer than others, and all were still working after three months.

IN BRIEF

Still, it's best to avoid the chemical onslaught of a bomb if you can, so if you've only got a few roaches, try a bait, mat, gel or spray. These are also good follow-up options if you feel you have to use a bomb first.



Baits and mats: Good as a maintenance strategy, and the poison is confined to the bait. Dead End mats were clearly the best of them.

- Bombs, sprays, mats and baits all worked well. If you prefer not to spray chemicals around your home, the DEAD END mats were the star performer in the mats/baits group.
- Hygiene is an important part of an anti-roach strategy.
- Be careful to protect kids and pets from sprays and bombs, and not to contaminate food and utensils.

WHAT TO BUY

Baits / mats / gels

DEAD END Cockroach Insecticide Mats

\$4.00

No other bait or gel could match the DEAD END mats' killing power at any stage of the test.

Surface sprays / bombs

All the sprays and bombs worked very well — you'd probably be happy with any of them, so go for the cheapest. However, the BLACK & GOLD and HOME BRAND sprays weren't working as well after three months.

COCKROACH TREATMENTS



Sprays: Handy when you find an occasional cockroach or three, but take care around food.

Hygiene

You'll find it easier to keep numbers down if you turn your home into a cockroach desert, with no supplies of food and water to hand. So:

- Clean up food scraps and crumbs; don't leave washing up till morning.
- Store food in tightly sealed containers and clean up any spills immediately.
- Make your rubbish hard to get at: keep organic waste in tightly covered garbage cans and put rubbish out at night.
- Don't leave out pets' food dishes overnight.
- Clear up potential breeding grounds, such as old piles of rubbish.

Sprays

While sprays can't get to all the areas that a bomb can, they do give a wider coverage than baits. However, you need to be careful not to contaminate food and utensils.

Again, the sprays were all very effective and most were still working well after three months. However, the BLACK & GOLD Household Insecticide Crawling Insect Killer and HOME BRAND weren't as good as the rest at this stage.

Baits, mats and gels

Baits aren't effective against a large roach population but, as a maintenance strategy, they can stop one building up.

Their advantage is that, unlike sprays and bombs, the poison is confined to the bait — and the cockroach that nibbles it. So they're a good solution if you're concerned about, for example, spray getting on your kitchenware or surfaces your kids or pets might touch.



All the bombs gave very similar results, so we'd suggest buying the cheapest you can find.

The DEAD END Cockroach Mat stood out: after one day, it had killed almost all the cockroaches, while no other product of this type managed to kill even half. We found some baits were still working very well at the end of the three-month trial, so you may be able to use them for longer than the manufacturer suggests.

Green remedies

Some people champion alternatives to a chemical solution (see *Reports from the front line*, below left), but so far they haven't done well in our tests. Borax and an electronic zapper both got the thumbs down in our last test (CHOICE, November 1993).

This time, we tried the LO LINE Cockroach Trap, which uses a pheromone lure to attract cockroaches into a sticky-floored trap. The traps were replaced frequently, but they weren't very effective.

A natural bait that stops cockroaches producing uric acid, which they need to survive, is being developed in the US, so an environmentally friendly solution could be around the corner. But for now, chemical warfare seems to be the best answer.

Reports from the front line

We asked you earlier this year how you deal with cockroaches at home. Judging by the number and length of replies, many of you plan your skirmishes with military precision.

You won't be able to try all the solutions offered at home: one reader found an escaped mouse extremely effective, while another said her roach problem ended when a colony of red ants moved in. But here are a few home remedies you might want to try:

- Some of you swear by **borax**, mixed with sugar, as a good 'green' solution. But this mixture failed miserably in our last cockroach killer test (CHOICE, November 1993) and it got mixed reviews in your letters — Norman Poulter of Nedlands, WA, found "the cockroaches seemed to thrive on it".
- VA Capper of Hammersley, WA, suggests an interesting variation: a mixture of **plaster of Paris** and **icing sugar**, which left his cockroaches "on their backs, stiff as the proverbial".
- Many of you use one version or other of the **sticky trap**. Lloyd Gregory of Rutherford, NSW, for example, takes an ordinary jam bottle, baits it with honey and greases its inside with cooking oil so the cockies can't climb out.
- Or there's another option: share your **booze** with the cockies. Readers have found red wine and champagne much to their roaches' liking: Evan Weise of Bundaberg, Queensland, recommends leaving the dregs of a bottle out, so "they can party themselves into a drunken stupor and drown in the fluid".

Which surfaces do they work on?

If you're using sprays or bombs, the surfaces in the room you're treating make a big difference to long-term efficacy.

We tested the sprays and bombs on ceramic tiles, plain pine and on pine painted with water-based paint. All the treatments were very effective immediately, whatever the surface. But when we checked again at four, eight and 12 weeks, the situation had changed.

Most of the treatments applied to plain pine or tiles were still working reasonably well at 12 weeks. Those applied to painted pine, on the other hand, had generally stopped working, and the results were so erratic they're not worth reporting. We found this in our last test as well, so paint and sprays don't seem to be a good long-term combination.

What are the risks?

You don't want to share your home with roaches, but you also don't want to ruin the environment or your health. All these products contain potentially hazardous chemicals, apart from the **LO LINE Cockroach Trap**, which wasn't very effective. See the table overleaf for details of the chemicals in each product.

The birds and the bees

If you're a beekeeper or you've an aviary or fishtank, you'll need to be careful not to kill your friends while killing your foe. Baits should be safe enough, as long as they're used and disposed of with care, but you'll have to be careful how and where you spray and bomb. All the products in this test (apart from the **LO LINE Cockroach Trap**) are toxic to bees and fish.

The picture's slightly brighter for bird owners: the **DEAD END Cockroach Insecticide Mat**, all the bombs and all but two of the sprays (the **BAYGON High Performance Spray** and **BAYGON Low Irritant Surface spray**) should be OK to use.

More worrying chemicals have been used in the past: Reader Lynette Bennett of Edgecliffe, NSW, writes: "I'm old enough to remember our lounge and carpets being saturated with DDT, which was at that time considered to be quite safe."

Health risks

All these products (except the **LO LINE Cockroach Trap**) are potentially harmful to humans. Handle baits and mats carefully and avoid breathing in the fumes from sprays and bombs. Health risks include:

- **Chlorpyrifos**, in all the baits and the one gel tested, is easily absorbed through your skin or by breathing it in. One-off overexposure to it can provoke headaches, fatigue, giddiness, nausea and asthma-like symptoms, and

potentially delayed effects on the nervous system, so handle baits carefully.

- People with chronic respiratory disorders can be particularly susceptible to the irritating effects of **pyrethrins** and **allethrin**, which are in the **RAID**, **BAYGON** Odourless, **SAVINGS**, **NO FRILLS** and **BLACK & GOLD** sprays.

If you're using chemicals to kill cockroaches, you can't completely avoid health risks or potential environmental damage. However, baits and mats are a good choice from this point of view as there's no spray residue or inhalation risk, as with sprays and bombs. You might prefer to use baits rather than mats if you have young children, as the poison they contain is less available to prying fingers.

Finally, if you don't like any of the options in our test, get a cat, for, according to the Gumbie Cat in T S Eliot's *Old Possum's Book of Practical Cats*:

"She thinks that the cockroaches just need employment to prevent them from idle and wanton destruction", and can form "...from that lot of disorderly louts, a troop of well-disciplined helpful boy-scouts, with a purpose in life and a good deed to do..." and can even create "a Beetles' Tattoo."



Dead End mats — they're back

We've had a number of letters over the past couple of years, asking what happened to **DEAD END** mats. Readers had bought the mats after their success in our November 1993 test and were disappointed when they disappeared from supermarkets.

The mats are now being made again by Easy Pak, the original manufacturer. They're back on the shelves in Franklins, Woolworths and Mitre 10; if you have any problems buying them, Easy Pak can be contacted on (02) 9521 861.

The mats arrived too late to be in our test for the whole three months, but we included them for the final month. The results were very similar to the previous test, so we've included the third-month results from our last test in the table.

Pest Free

We've had a number of letters about various electronic devices claimed to kill cockies, including one called **PEST FREE**, mainly sold through *Innovations* magazine. You simply plug this device into any power point and it sends a low-frequency pulse through your electrical wiring system, altering the electromagnetic field around it and supposedly making your home a no-go area for roaches.

Unfortunately we couldn't test whether or not it works, because our tests were conducted in a lab, rather than a full-scale home. But we did look at the electronics of one of these devices, and seriously doubt it would work. In a normal household, domestic appliances would cause similar, though much greater, disturbances in the electromagnetic field surrounding the wiring.

We've also had letters from people who've bought the devices: some say they work, some don't. Ernst Millet of Newcastle found his roaches "living on the plug-in unit".

The test

We placed baits, mats and gel, used the sprays and set off the bombs (in accordance with the instructions) in a test chamber containing cockroaches. This test couldn't cover products that claim to contain 'eggstoppers' as that would require a different test method.

- The **bombs** were tested in a mock kitchen, complete with kitchen units, etc. Cages of cockroaches were placed around the 'kitchen' and free-range cockies were allowed to wander at will.

- The **sprays** were tested in chambers containing one of three surfaces: tiles, plain pine or painted pine (see *Which surfaces do they work on*, left).

- The **baits** were tested in a chamber containing supplies of food and water, so the roaches weren't forced to nibble the baits. The chambers were roomy and there was a sheltered area, so the cockies could avoid the baits altogether if they chose to.

COCKROACH TREATMENTS

1

Brand / product (in rank order within category)	Manufacturer / distributor	Origin	Price per pack (\$)*	Active ingredients
BAITS / MATS / GELS				
DEAD END Cockroach Insecticide Mats	Easy Pak	Australia	4.00	0.1 g cypermethrin/mat
MORTEIN PLUS Lure 'n' Kill Superbaits	Reckitt & Colman	Australia	2.69	5 g/kg chlorpyrifos
MORTEIN PLUS Nest Kill Superbaits	Reckitt & Colman	Australia	7.80	5 g/kg chlorpyrifos
BAYGON Cockroach Stopper Killing Gel	Bayer	Netherlands	4.47	16 g/kg chlorpyrifos
BAYGON Cockroach Stopper	Bayer	Greece	6.69	5 g/kg chlorpyrifos
SURFACE SPRAYS				
MORTEIN PLUS Lure 'n' Kill	Reckitt & Colman	Australia	5.99	0.7 g/kg imiprothrin; 2.0 g/kg cypermethrin
RAID Surface Spray with Natural Pyrethrum	SC Johnson	Not stated	5.79	2.0 g/kg pyrethrins; 1.7 g/kg cypermethrin; 7.2 g/kg piperonyl butoxide
FARMLAND Surface Spray	Coles	Australia	3.99	3.5 g/kg tetramethrin 20:80; 2.0 g/kg cypermethrin
MORTEIN PLUS Odourless Low Irritant	Reckitt & Colman	Australia	5.97	2.79 g/kg permethrin 25:75; 1.38 g/kg tetramethrin 20:80
NO FRILLS Surface Spray	Franklins	Australia	1.65	2.85 g/kg permethrin 25:75; 1.0 g/kg allethrin 20:80
BAYGON High Performance	Bayer	Australia	6.99	10 g/kg propoxur; 0.4 g/kg transfluthrin; 0.4 g/kg cyfluthrin
PEA-BEU Surface Spray	Pea-Beu	Australia	4.69	2.79 g/kg permethrin 25:75; 1.38 g/kg tetramethrin 20:80
BAYGON Low Irritant	Bayer	Australia	6.97	10 g/kg propoxur; 0.4 g/kg transfluthrin; 0.25 g/kg cyfluthrin
SAVINGS Surface Spray	Coles	Australia	2.15	2.88 g/kg permethrin 25:75; 1.0 g/kg allethrin 20:80
BAYGON Odourless with Natural Pyrethrum	Bayer	Australia	6.99	2 g/kg pyrethrin; 0.4 g/kg cyfluthrin; 10 g/kg piperonyl butoxide
BLACK & GOLD Surface Spray	Black & Gold	Australia	2.16	2.85 g/kg permethrin 25:75; 1.0 g/kg allethrin 20:80
HOME BRAND Surface Spray	Woolworths	Australia	1.66	2.79 g/kg permethrin 25:75; 1.38 g/kg tetramethrin
BOMBS				
RAID Exterminator (A)	SC Johnson	Not stated	10.74	10 g/kg permethrin 25:75
RAID Roach Bomb (A)	SC Johnson	Not stated	12.65	10 g/kg permethrin 25:75
MORTEIN Control	Reckitt & Colman	Australia	10.65	10 g/kg permethrin 25:75; 0.77 g/kg fenoxycarb
MORTEIN PLUS Roach Bomb	Reckitt & Colman	Australia	8.87	10 g/kg permethrin 25:75; 6 g/kg fenoxycarb
STICKY TRAP				
LO LINE Cockroach Trap	Dunluce International	UK	16.50	Pheromone attractant

Cockie data

Most of the cockroaches in your home are likely to be either the American (large and dark) or German (small and paler brown) type. We tested the products separately on each type, but the results don't suggest any product is particularly more effective at dealing with either.

■ The **American cockroach** is a large species at 30–40 mm long. It's a shiny reddish-brown colour and can fly, though it rarely does.

They usually live inside in cold regions and outside in warmer ones. They prefer dark and moist areas, and are often found near bathrooms, basements and sewers.

Their egg cases, containing 12–16 eggs, are usually left attached to a surface, close to a source of food and water. The female lives up to two years, producing between 10 and 50 cases.

Problems: This cockroach can live for two or three months without food, making it hard to starve out.

■ The **German cockroach** is small (10–15 mm long) but prolific. Thanks to the shipping of food and goods, it's probably the most widespread type. It's tan-coloured, has wings, but rarely flies.

It usually lives indoors, and prefers to be close to moisture, warmth and food, so you're likely to find it in kitchens, bathrooms and food storage areas.

Its egg cases, containing 30–40 eggs, are carried by the female until they're ready to hatch. She's likely to live for up to a year, producing five to eight cases.

Problems: These roaches can be resistant to some chemicals, making them harder to kill. In infancy, they're small and don't have wings, so they're hard to recognise. You might ignore them until you've got a real infestation — and these cockies breed fast.

Populate or perish?

Baby German cockroaches will be mature in around nine weeks, while their American cousins take around nine months to mature.

So if you started with two German cockroaches, within 20 weeks you'd have great-grandparents who'd sired a population of roughly 50,000. The American cockroaches, on the other hand, would be mere parents, with roughly 180 offspring.

KILL RATE

Knockdown speed
(seconds)

24 hours (%)

1 month (%)

3 months (%)

Overall score (%)

Brand / product (in rank order within category)

Not applicable	94	100	100 (C)	98	DEAD END Cockroach Insecticide Mats
Not applicable	28	93	99	73	MORTEIN PLUS Lure 'n' Kill Superbaits
Not applicable	29	90	90	70	MORTEIN PLUS Nest Kill Superbaits
Not applicable	19	63	79	54	BAYGON Cockroach Stopper Killing Gel
Not applicable	6	68	82	52	BAYGON Cockroach Stopper

22	100	100	100	100	MORTEIN PLUS Lure 'n' Kill
85	100	100	100	100	RAID Surface Spray with Natural Pyrethrum
38	100	100	98	99	FARMLAND Surface Spray
62	100	100	98	99	MORTEIN PLUS Odourless Low Irritant
41	100	98	98	99	NO FRILLS Surface Spray
111	100	100	93	98	BAYGON High Performance
36	100	95	93	96	PEA-BEU Surface Spray
85	100	95	85	93	BAYGON Low Irritant
117	100	100	80	93	SAVINGS Surface Spray
135	100	90	83	91	BAYGON Odourless with Natural Pyrethrum
62	100	90	68	86	BLACK & GOLD Surface Spray
30	100	95	58	84	HOME BRAND Surface Spray

< 90 min	100	100	100	100	RAID Exterminator (A)
< 30 min	100	100	100	100	RAID Roach Bomb (A)
< 60 min	100	100	95	98	MORTEIN Control
< 60 min	100	95	100	98	MORTEIN PLUS Roach Bomb

Not applicable	49 (B)	Not applicable	Not applicable	49 (B)	LO LINE Cockroach Trap
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* Prices are those we paid in May 1999.

(A) This product will be discontinued early next year.

(B) Percentage of roaches trapped.

(C) Results from previous cockroach killer test in 1993.

1 Active ingredients

The chemicals used in each product are listed. See *Health risks*, page 45, for more information on some of these chemicals.

2 Knockdown speed

We recorded how long it took for all the cockroaches in the chamber to be knocked down. This means they're lying on their backs, waving their legs. They'll then become moribund: they'll look dead, but they'll move when prodded. This is soon followed by death. This was done for the sprays and bombs, which are intended to kill on the spot, but not for the baits, mats, gel and sticky trap, which work more slowly.

3 Kill rate at 24 hours

This shows the percentage of cockroaches in the test chamber that had died within 24 hours.

4 Kill rate at one and three months

Fresh cockroaches were put in the test chamber every month, to see how effective the treatment would be over a longer time period. The number in the table shows the percentage of cockroaches that had died within 48 hours (for the sprays and bombs) or 14 days (for the baits, mat and gel) of being introduced.

5 Overall score

This is an average of the kill rates at 24 hours, one month and three months.



If you're still desperate ...

For more tips and information on an environmentally friendly approach to controlling unwanted visitors, try the CHOICE Book *Safer Pest Control* by Paul Rogers.

● RECALLS & BANS

If you find a recall or ban not on our list, please let us know. Companies often rent 1800 numbers for a couple of months after the recall is announced. If the number given is no longer operating, phone the manufacturer or retailer direct. For up-to-the-minute information, check our recalls list by clicking the recalls banner at www.choice.com.au.

THE PRODUCT: Procter & Gamble has recalled **Vicks Sinex Long-Action Nasal Decongestant** in the following packaging:

- 20 mL metered pump spray.
- 20 mL metered pump spray refill.
- 15 mL spray.

Affected bottles have batch numbers between 504 and 522 (stamped in gold).

The problem: The sprays may have accidentally been diluted with a disinfecting agent. They may not work and could irritate nasal membranes.

What to do: Return the sprays to the place of purchase for a refund or call 1800 812 502 for more information.

THE PRODUCT: Kawasaki has recalled its **Model JH1200-A1 Jet Ski Watercraft**, with vehicle identification numbers (VIN) from KAW4003A999 to KAW41494D999. The VIN can be found on the rear right-hand side of the hull.

The problem: Riders could lose steering control of the jet ski; the steering cable nut could break due to overtightening at the factory.

What to do: Don't ride the jet ski. Contact your Kawasaki dealer to arrange for a replacement nut or call your local Kawasaki office on:

- NSW and the ACT: (02) 9684 2585.
- Queensland: (07) 3855 2755.
- SA and the NT: (08) 8365 3430.
- Victoria and Tasmania: (03) 9338 5855.
- WA: (08) 9277 7977.

THE PRODUCT: Granny May's has recalled **inflatable cushions containing polystyrene beads**, sold in Granny May's stores from April 1, 1999, to August 13, 1999.

The problem: The beads pose a choking risk to children if they leak from the cushions, which don't meet the requirements of the standard relating to bean bags.

What to do: Return the cushions to any Granny May's store for a refund or call (02) 9281 7978 for more information.

THE PRODUCT: Stihl has recalled **FS 120/200/350 Brushcutters** and **BT 120 Earth Augers**, with serial numbers from 41585423 to 42423154. The serial number is engraved on a plate attached to the tool.

The problem: The fuel tank could leak and pose a fire risk, due to a manufacturing defect.

What to do: Don't use either tool; contact your nearest Stihl dealer for a replacement tank. Call Stihl on 1300 366 665 for dealers' addresses or 1800 337 927 for more information.

THE PRODUCT: Cyprus and Sons has recalled **Chang's Stir-Fry Rice Noodles Vermicelli** with a use-by date of December 31, 2001.

The problem: Iron particles were found during routine testing.

What to do: If there are black spots in the noodles, don't eat them. Return them to the place of purchase for a refund or call (02) 9748 3490 for more information.

THE PRODUCT: The Health Department of WA has recalled (**Princi Smallgoods**) **Aniseed Cacciatrice Italian-Style Sausages**, 325 g, sold in WA. The sausages are sold linked together, with a crimp tag and label on a string; affected sausages have a green string and tag.

The problem: Contamination with *E coli* (which can cause vomiting and diarrhoea) was found during routine testing.

What to do: Don't eat the sausages. Return them to the point of sale for a refund. For more information, call the WA Health Department on (08) 9388 4999.

THE PRODUCT: Benjamin Duncan Original Exports has recalled **Race 2005 Energy Blast with Guarana and Ginseng Liquid** (55 mL) and **Powder** (70 g).

The problem: The labelling doesn't adequately state the caffeine content. Also, the product isn't included in the Australian Register of Therapeutic Goods.

What to do: Don't consume Race 2005; return it to the place of purchase for a refund or call (03) 9484 9566 for more information.

THE PRODUCT: Peerless Products has recalled **3 and 5 tonne bottle jacks** (blue) and **2½ tonne trolley jacks** (orange). The manufacturer's name, Wen-An China, is stamped on them.

The problem: The jacks' bases and head caps are smaller than required by the relevant Australian standard. Their capacity and operating instructions aren't marked on them, as required.

What to do: Don't use the jacks. Contact Peerless Products on (03) 5443 1166 for more information and a refund.

THE PRODUCT: White Wings Foods has recalled **Shaker Pancakes Original**, 375 g, with a use-by date of 19/02/00.

The problem: The pancake mixture may have been contaminated with a non-toxic fizzing agent during manufacture. This could cause the bottle to rupture.

What to do: Don't make the pancakes. Return the mixture to the point of purchase for a refund, or call 1800 025 768 for more information.

THE PRODUCT: Saab has recalled three-door and convertible **1998-99 Saab 9-3** vehicles with manual seats and vehicle identification numbers (VIN) as follows:

- 3D: W2050001-W2069660 and X2000001-X2029881.
- CV: W7050001-W7056548 and X7000001-X7024338.

The VIN is stamped on a plate on the dashboard, on the passenger side, and can be viewed through the windshield.

The problem: The front seats may fail to correctly lock into position. This wouldn't be noticeable during driving, but in certain circumstances the seats could slide unexpectedly.

What to do: Contact an authorised Saab dealer as soon as possible to arrange inspection and repair or call (03) 9257 0900 for more information.

THE PRODUCT: Volvo has recalled 1997-98 **850, S70, V70 and C70** series vehicles. Serial details are displayed at the rear. The model year is listed on the compliance plate, under the bonnet on the passenger side, near the battery.

The problem: The headlight switch may fail, preventing the lights from being switched on. Also, the passenger airbag in some S70, V70 and C70 models may be sensitive to electrostatic discharge: if a passenger touches the dashboard before touching any other part of the vehicle, the airbag may accidentally deploy.

What to do: All buyers have been sent a letter providing contact details for a Volvo dealership for repairs. If you own a relevant car and haven't received notification, contact Volvo customer relations on (02) 9903 9200.

THE PRODUCT: Fluke Australia has recalled **T2 Electrical Testers** with serial numbers:

- 70521601-74165430.
- Below 70521601 unless there's an 'R' stamped after the serial number.

The problem: Exposure to vibration can cause corrosion to the positive battery contact, which could cause the tester to operate intermittently and fail to indicate that voltage is present, placing the user in a potentially hazardous situation. The testers with serial numbers below 70521601 were subject to a previous recall in November 1998. If an 'R' has not been stamped after the serial number, the tester has not been repaired.

What to do: Don't use the tester. Call (02) 8850 3333 for more information and to arrange for repairs. A free field repair kit is available.

THE PRODUCT: BMW has recalled **R1100S motorcycles** with vehicle identification numbers (VIN) ZA80001 to ZA90056. The VIN can be found on the compliance plate, located between the tank and handlebar areas.

The problem: There's a risk of the brake-linkage ball end, which is screwed onto the rear brake pedal, working loose and becoming detached, preventing the rear brake from being applied.

What to do: All owners will be contacted directly and referred to a servicing dealer for repairs conducted free of charge under warranty. If you haven't received notification, contact BMW on 1800 813 299 for more information. If you have sold your motorcycle, please contact BMW to advise of the new owner.

PUBLIC ANNOUNCEMENT

THE PRODUCT: Sheridan

Australia has announced it has not authorised the sale of its products through **VJC House of Linen**.

The problem: VJC House of Linen recently advertised Sheridan sheet sets.

What to do: If you have ordered these sheets, call Sheridan on 1800 625 516. Sheridan would be grateful for any information and will test sheets to determine whether they are a Sheridan product.

Subscription problems, GST subscription price queries or changes of address: Write to CHOICE Consumer Services, 57 Carrington Road, Marrickville 2204, phone (02) 9577 3399, fax (02) 9577 3355 or email to ausconsumer@choice.com.au. Please include your subscriber number (found in the top corner of your CHOICE address label) or have it ready by you when you phone us.

You can also subscribe to the magazines and buy books via our secure Web shop: www.choice.com.au

Your subscription will start with the issue noted below and we'll also send you the current issue as a bonus.

Subscriptions

	Cost \$ (includes GST — see below)	Qty Self	Qty Gift	Amount
CHOICE (11 issues a year)				
1 year	56.95 Personal subscription	.....	.....	.....
2 years	107.73	.....	.....	.....
1 year	75.93 Company/institution	.....	.....	.....
2 years	146.51	.....	.....	.....

Overseas, a one-year personal subscription costs \$66 incl. postage; \$122 for two years.

These prices are for subscriptions starting with the January/February 2000 issue.

Consuming Interest

	Cost \$ (includes GST — see below)	Qty Self	Qty Gift	Amount
Consuming Interest (4 issues a year)				
1 year	28.35 Personal subscription	.....	.....	.....
2 years	53.75	.....	.....	.....
1 year	36.75 Company/institution	.....	.....	.....
2 years	72.03	.....	.....	.....

Overseas, a one-year personal subscription costs \$33 incl. postage; \$60 for two years.

These prices are for subscriptions starting with the Summer 2000 issue.

CHOICE Travel

	Cost \$ (includes GST — see below)	Qty Self	Qty Gift	Amount
CHOICE Travel (4 issues a year)				
1 year	28.35 Personal subscription	.....	.....	.....
2 years	53.75	.....	.....	.....
1 year	36.75 Company/institution	.....	.....	.....
2 years	72.03	.....	.....	.....

Overseas, a one-year personal subscription costs \$33 incl. postage; \$60 for two years.

These prices are for subscriptions starting with the March 2000 issue.

CHOICE Health Reader

	Cost \$ (includes GST — see below)	Qty Self	Qty Gift	Amount
CHOICE Health Reader (10 issues a year)				
1 year	52.50 Personal subscription	.....	.....	.....
2 years	101.05	.....	.....	.....
1 year	75.60 Professional/institution	.....	.....	.....
2 years	144.05	.....	.....	.....

Overseas, a one-year personal subscription costs \$62 incl. postage; \$116 for two years.

These prices are for subscriptions starting with the January/February 2000 issue.

Computer CHOICE

	Cost \$ (includes GST — see below)	Qty Self	Qty Gift	Amount
Computer CHOICE (6 issues a year)				
1 year	33.60 if you subscribe to CHOICE or	.....	.....	.....
2 years	64.50 another of our publications	.....	.....	.....
1 year	37.80 Computer CHOICE alone	.....	.....	.....
2 years	73.10	.....	.....	.....
1 year	50.40 Company/institution	.....	.....	.....
2 years	96.75	.....	.....	.....

Overseas, a one-year personal subscription costs \$44 incl. postage; \$82 for two years.

These prices are for subscriptions starting with the January/February 2000 issue.

Filing systems

	Colour	Qty Self	Qty Gift	Amount
Filing systems				
Box holder (holds 24)	\$12 Red	.....	.....	.....
	Blue	.....	.....	.....
Binder (holds 12)	\$12 Red	.....	.....	.....
	Black	.....	.....	.....
Health Reader binder	\$12 White	.....	.....	.....
(holds 2 years)				

Order Total \$

Payment method

This order is a ☐ New subscription ☐ Renewal

I wish to pay by ☐ Cheque ☐ Money Order
(payable to Australian Consumers' Association)

or, I wish to pay by ☐ Bankcard ☐ Mastercard ☐ Visa ☐ Amex ☐ Diners Club

Card number

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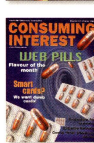
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Manager: Raja Rajagopal. **Contact:** Jeanette Dwyer on (02) 9577 3399.

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* indicates an update of a previous report, additions or corrections to reports, small follow-up items or letters.

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theHARD word

Heinz
Egg Custard

Custard

INGREDIENTS: Skim Milk, Sugar, Ground Rice, Thickener (Modified Maize Starch), Egg Yolks, Butter, Vegetable Oil, Flavour, Water Added.

Egg Custard

- ✓ No Added Sugar
- ✓ No Preservatives
- ✓ No Artificial Colours or Flavours
- ✓ Gluten Free

So this means there's no sugar added to the sugar that's already been added, right?

IN ESSENCE
AROMATHERAPY
ALOE VERA & WHEATGERM

AROMA BAR

non fragrant for sensitive skin

What's the point of a non-fragrant aroma bar?

How about a little help?

The hard word would like to thank all the readers who've responded with examples of outrageous ads, promotions and products. Thanks to K Faulkner, J Cottle, P Stott, C Kramer and A Evans for their contributions to this month's *The hard word*. Please keep sending them in.

If you have any examples that you think deserve to be on this page, send them to *The hard word*, CHOICE, 57 Carrington Road, Marrickville 2204, or email your suggestions to thehardword@choice.com.au.

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No wonder they're such a bargain ...
Or is it just an unfortunate typo?

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But what made the chaos? Perhaps it was this expensive (\$3295!) car toy: even people who can't read maps know you won't take a roundabout this way in this country — or you might create chaos ...

CHAOS MADE THE TRAFFIC JAM... F

BONUS
6 DISC STAGE
ONLY FOR LIMITED TIME

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and a friend

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